RC
870
C5
[redacted]
UC-NRLF
B 4 621 276

TRANSACTIONS

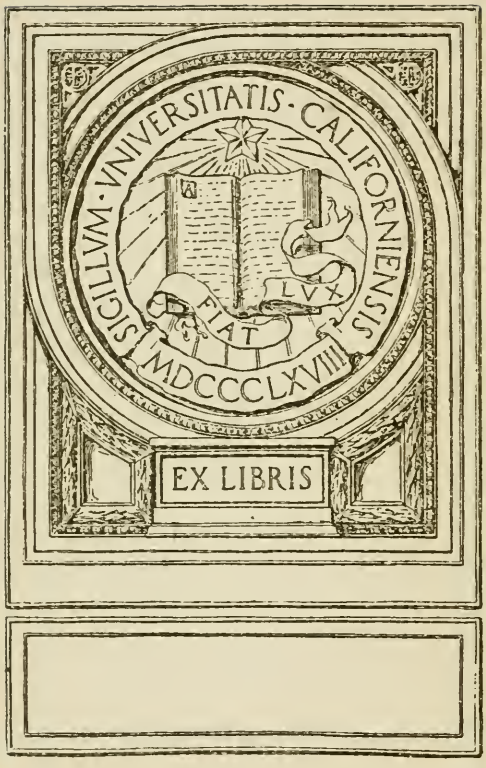
OF THE

Chicago Urological Society

For the Year 1915-1916

Reprinted From

CHICAGO
1916


SIGILLVM · VNIVERSITATIS · CALIFORNIENSIS
LVX
FIAT
MDCCCLXVIII
EX LIBRIS

TRANSACTIONS

OF THE

Chicago Urological Society

For the Year 1915-1916

President:
HERMAN L. KRETSCHMER.

Vice-President:
D. R. McMARTIN.

Secretary:
IRVIN S. KOLL.

CHICAGO
1916

RC870
C5

UNIV. OF
ARIZONA

INDEX.

PAGE

Adeno-Carcinoma of the Kidney, Primary. Illustrated. By J. S. Eisenstaedt, M. D. 18

American Urological Association (North Central Section) with the Chicago Urological Society, Transactions of, Meeting November 12th and 13th, 1915 90

Aspermatism. By V. D. Lespinasse, M. D. 213

Chicago Gynecological and Chicago Urological Societies, Joint Meeting, Transactions of, March 17th, 1916. 170

Chicago Medical and Urological Societies, Joint Meeting, Transactions of. January 5th, 1916. 143

Chicago Urological Society, Transactions of, Meeting October 21st, 1915. . 54

Chicago Urological Society, Transactions of, Meeting April 13th, 1916. ... 197

Chicago Urological Society, Transactions of, Meeting May 25th, 1916. ... 214

Cystinuria and Cystin Stones, With a Report of a New Family of Cystinurics. Illustrated. By Herman L. Kretschmer, M. D. 1

Cystoscopic Burn, A Very Unusual Case History Presenting Among Other Features a. Ilustrated. By F. R. Charlton, M. D. 31

Epididymitis (Acute), Surgical Treatment of. By Charles M. McKenna, M. D. 192

Gonorrhea and Marriage. By Irvin S. Koll, M. D. 141

Gonorrhea in the Male (Acute), Complications of. By Robert H. Herbst, M. D. 130

Gonorrhea Complement Fixation Test. By V. D. Lespinasse, M. D. 128

Immunity, The Bio-Chemistry of the Gonococcus in Its Relation to. By Carl C. Warden, M. D. 125

Infections, Some Factors in the Diagnosis of Kidney and Bladder. By Arthur H. Curtis, M. D. 162

Infection of the Kidneys and Ureters, Clinical Review of 240 Cases of Non-Surgical. By Gilbert J. Thomas, M. D. 66

Inflammation of the Seminal Duct, Treatment of Non-Tuberculous. By R. W. Staley, M. D. 73

Operations by Local Anesthesia on the External Genitalia and Prostate. By A. C. Stokes, M. D. 49

Operative Urethroscope, A New Form of. Illustrated. By Ernest G. Mark, M. D. 37

Phylacogen in Urological Practice. By Frederick W. Robbins, M. D. ... 56

Prostitution and Gonorrhea. By Lewis W. Bremerman, M. D. 138

Pyelitis, Treatment of. By Herman L. Kretschmer, M. D. 166

Pyelo-Cystitis in Infancy, Course and Prognosis of. By Clifford G. Grulee, M. D. 158

Pyelitis in Pregnancy, Some Observations on. By J. Clarence Webster, M. D. 151

Renal Pelvis, Some Studies on the Anatomy of. By Daniel N. Eisendrath, M. D. 188

Radiotherapy and Diathermy in Malignant Tumors of the Bladder. By G. Kolischer, M. D. 26

71323A

PAGE

Seminal Vesiculitis. By Edward W. White, M. D. 205

Seminal Vesicles, Anatomy and Pathology of. Illustrated. By E. O. Smith, M. D. 40

Syphilis of the Prostate. By A. Ravogli, M. D. 62

Tabes, The Bladder in Early. Report of a Case. By Wm. S. Ehrich, M. D. 35

Tuberculosis of the Seminal Vesicle and Epididymis. By H. W. Plaggemeyer, M. D. 79

Ureteritis, Notes on. By Harry Kraus, M. D. 195

Vesical Neck, Chronic Edema of the. By Henry J. Scherck, M. D. 28

Vulvo-Vaginitis in Children. By Isaac A. Abt, M. D. 134

CYSTINURIA AND CYSTIN STONES. WITH A REPORT OF A NEW FAMILY OF CYSTINURICS.*

By Herman L. Kretschmer, M. D., Chicago, Ill.,

Urologist to Presbyterian Hospital; Junior Surgeon to Children's Hospital; Genito-Urinary Surgeon to Alexian Brothers Hospital.

The credit for having first described cystin as a constituent of urinary calculi is given to Wollaston, who reported his discovery of a new constituent of urinary stone in The Philosophical Transactions of London for 1810. Wollaston's first case occured in a child aged 5, and the second in a man of 46.

The term cystic oxide was used by Wollaston in his publication; it was also used by subsequent writers on this subject, namely, by Bennett, Brande, Heath, Jones, Neill, Schweig, Stromeyer, Thompson and others. Later, this term was changed by Berzelius, "because the substance was found not to be an oxide (Fowler)."

Frequency.

Cystin stones belong to the rarer forms of urinary calculi. Doubtless because of their rare occurrence, but little space is devoted to them in the various text-books on urinary surgery. Since the original publication of Wollaston, one hundred and fifteen years ago, I have found reports of 107 cases of cystin stone, including the two cases to be reported in this paper.

It has been my good fortune to see two cases of this rare condition within a year; these cases seem worthy of report for the following reasons:

1. The two cases were twin boys, aged 9.
2. Chemical examinations demonstrated the fact that in each case we were dealing with pure cystin stones.**
3. A positive diagnosis of vesical calculus was made in each case before operation *by cystoscopic examination and X-rays.*
4. In both cases the calculi were removed by litholapaxy.
5. Other members of the family show the presence of cystinuria.

Case I.—F. D., male, aged 9, was first admitted to the Children's Memorial Hospital to the service of Drs. Churchill and Walker.

Present Illness. About three years ago the patient began to suffer from constipation; at times he would not have a bowel movement for several days to a week. Enemas and medicine were used regularly. Soon afterward he began to have great difficulty in urination; he was obliged to

*Read at the meeting of the Chicago Urological Society October 28, 1915.

**I am indebted to Dr. S. A. Amberg, of Sprague Memorial Institute, for these chemical examinations.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, January, 1916.]

strain during micturition, and on exposure to cold or wet would have incontinence. For the past two months he urinated very frequently and involuntarily, and wet the bed regularly every night. He was very active, had a good appetite and slept well.

Physical Examination. The patient is a well-developed boy, bright and very active. The skin is clear; no eruptions. The head is large but regular; the scalp is negative. The eyes are negative. The ears are negative to external examination, as is also the nose. The mouth and tongue are clean, with normal membrane. A throat culture is negative to the Klebs-Loeffler bacillus. There are no Koplik spots and the throat is negative. The teeth are poor. The submaxillary glands of the neck are enlarged. The lungs are negative. The heart shows a slight irregularity but there is no enlargement. The abdomen is held somewhat tense. The liver and spleen are not palpable. The penis is well developed. *Urine dribbles continually.* The extremities are negative. All reflexes are normal.

Second Admission. August 4, 1914, the child was readmitted to the hospital for the same trouble, *incontinence of urine.* The incontinence seemed to be a great deal worse while the child was in school. He has had no pain on urination nor any difficulty in starting the stream. August 13, 1914, the patient had acute retention and was catheterized, 4 ounces of urine being removed. August 28, about 10 a. m., the patient complained of abdominal pain, but said nothing further about this, playing around as usual. At 4 p. m. he went to bed, complaining of chilliness. His temperature at 5:45 was 103½.° He refused supper. At 6 p. m. the patient's face was flushed; he was feeling hot and he said his 'head hurt.' The physician's examination revealed nothing abnormal in the lungs. There was a faint systolic whiff at the apex, but it was not transmitted elsewhere. The throat was reddened and the tonsils were slightly prominent. The abdomen showed voluntary spasm, but there was no tenderness. Tympanites everywhere except over the bladder. The liver was palpable, but the spleen and kidneys were not. No costovertebral tenderness. The patient was catheterized, but *urine showed no abnormal features.*

X-ray examination revealed three irregularly oval-shaped bodies, possibly stones, at the base of the bladder. (Fig. 1.)

Cystoscopic examination. Twelve ounces of urine were withdrawn by catheter. There was no cystitis. The right ureteral orifice appeared a little larger than the left. Three stones were seen in the base of the bladder, about the size of a small hazelnut, whitish in color, with irregular surface.

Urinalysis. The urine is very pale, clear and alkaline. There is no sugar. Albumin is present. There is no sediment, no casts, but a considerable number of squamous epithelial cells and many pus cells.

Operation. September 14, 1914, I carried out lithotripsy under ether anesthesia. About a teaspoonful of debris was removed by the use of the evacuator. Revisionary cystoscopy failed to show any fragments. There was some redness of the bladder and a few areas of edema.

Case 2. R. D., male, aged 9, was admitted to the Children's Memorial Hospital to the service of Drs. Churchill and Ryerson. His first admission was for an operation for paralysis of the left upper arm muscles, following anterior poliomyelitis. He was readmitted February 20, 1915. Since leaving the hospital he has been well except for his urinary distress, which consisted of pain in the suprapubic region, pain in the urethra during urination, and the passage of sand. There has also been some dribbling of urine for the past eight days. The pain in the suprapubic region he attributed to an injury received six or eigh months ago.

History (patient's). About a week after leaving the hospital in July, 1913, he began to have pains on urination and excepting for two days shortly after the beginning he has had pain ever since. He attended school up to two weeks before coming to the hospital. Urine has been passed

Fig. I.

Showing presence of 3 calculi in the bladder. Upon examination they proved to be pure cystin stones.

Fig. 11.

Shows presence of a very large stone which upon examination after litholapaxy revealed the presence of pure cystin.

with difficulty, coming slowly, and has contained white stringy masses.

Physical Examination. The boy is small and only fairly well developed. He cries a great deal with pain in the region of the bladder. The head is normal. The chest is bony and poorly nourished, though the resonance, heart borders, respiratory murmurs and heart sounds are normal. The muscles of the abdomen are tense; palpation over the lower border elicits pain. There is an area of dulness about the breadth of two fingers above the pubes. The rectal examination is negative. The liver and spleen are negative. The left arm is much smaller than the right. The left is partly paralyzed. On its anterior aspect at the shoulder is a scar where an operation for tendon transplantation has been done. The patellar reflexes were not obtainable. The penis is in semi-erection almost continually, and urine *dribbles* away involuntarily.

Blood Examination. Hemoglobin, 70 per cent.; red blood cells, 4,460,000; white blood cells, 14.700; polymorphonuclears, 56 per cent.; small morphonuclears, 44 per cent.

Urinalysis. The urine was clear, and contained acid, albumin and sugar. A culture revealed the Bacillis coli communis.

Cystoscopy. Examination with the cystoscope showed the presence of a large stone in the bladder.

X-Ray Examination. The x-ray showed one stone in the bladder (Fig. 2).

Operation. March 2, 1915, at 8 a. m., litholapaxy was performed under ether anesthesia and more than two tablespoonfuls of debris removed. Subsequent cystoscopic examination showed the bladder free from stone or detritus.

Because of the well known fact that cystinuria occurs in families, it was thought desirable to examine the urine of the other members of the family. The father's urine could not be obtained. The mother's urine was negative. The urine of the two sisters showed cystin crystals. The urine of the remaining boy showed the presence of a sulphur reaction, but no crystals were demonstrated in his urine. So that of the six members of this family (excluding the father, who would not send in a specimen of urine), two had cystin stones, two showed the presence of cystin crystals, one showed the presence of a sulphur reaction, and the sixth was normal.

Analysis of the Cases Reported in Literature.

Because of the rare occurrence of cystin stone it was thought desirable to review the cases reported in the literature and to present the results in brief form.

It was at once apparent that in a very large number of cases reported (106), very meagre descriptions were given, and in some, many of the more or less important details were omitted, so that the total number of accurately reported cases is far below the total number of cases reported.

If we consider the *frequency* of urinary stone, and the large numbers of cases reported, this series of 106 cases is a very small percentage of the total, so that we may freely say that cystin calculi are indeed very rare.

Sex.—There were sixty-five males and twenty-seven females; in fourteen cases nothing was stated

regarding the sex of the patient. It is quite evident that cystin stones occur much more frequently in males than in females. According to these figures, 70.6 per cent. of the cases occurred in males.

Age.—In thirty-two cases the age was not stated. In the remaining cases in which the age was stated, the following figures were obtained:

1 to 10 years	15 cases
11 to 20 years	9 cases
21 to 30 years	19 cases
31 to 40 years	15 cases
41 to 50 years	9 cases
51 to 60 years	4 cases
61 to 70 years	0 cases
71 to 80 years	1 case

The youngest case was reported by Manby, whose patient had passed a small waxy-looking cystin stone when only twelve months old. The oldest patient was reported by Henry Thompson. His patient was 81 years old and was reported well at 84.

In 73.34 per cent. of the cases, the stones occurred before the age of 40. There were only seven cases reported above 50. In only one case do we find cystin stone associated with prostatic hypertrophy, namely, in Fowler's case in which a perineal prostatectomy was performed.

From this evidence it is quite apparent that cystin stone is a disease of the young, and that as an accompaniment of prostatic disease in the aged, where we frequently find associated stone, it is of great rarity.

Location of Cystin Stones.

In thirty-four cases no statements were made relative to the location of the calculi. In thirty-seven the patients passed one or more calculi *per* urethra.

An interesting case is reported by Neill, in which the calculi were discharged through a suppurating wound in the abdominal wall. The patient evidently had a perirenal abscess that ruptured anteriorly. During the course of several months thirteen calculi were discharged through the wound.

In one case the stone lodged in the urethra (Winternitz).

The bladder was the seat of one or more calculi in forty-one cases, and the kidneys in seventeen. In two of the kidney cases the stones were bilateral. These are reported by Bennett and Link. In two cases (Műller, Link) stones were found in the bladder and kidneys. Link's case had several calculi in the right kdiney and one large one in the bladder.

Number of Stones.

Cystin calculi may be single or multiple. The largest number of cystin stones to be obtained from one patient was forty-five, reported by Rosenstein. Lichtenstern removed twenty-nine from the kidney of a patient, and Neill reported thirteen stones from

his patient. In thirty-nine cases the presence of one stone was recorded. Multiple stones were reported in thirty-eight cases.

Method of Obtaining Stones.

In two cases the stones were obtained at autopsy (Bennett, Bence-Jones).

Lithotrity was carried out by Chabrie, Wasserthal, MacPhail, Müller, Sautham, Thompson, Thorndike and Ogren, and Kretschmer.

In the two cases reported in this paper I had no difficulty in crushing the stones. That they are susceptible of being crushed is further proven by reports of other authors. I therefore cannot agree with the statement that these calculi cannot be crushed.

The largest cystin stone was removed by Reginald Harrison by lateral lithotomy. The stone weighed 1050 grains and was exhibited because of its size, which was the largest on record.

Occurrence of Cystinuria in Families.

One of the peculiar characteristics of cystinuria is its tendency to occur in families, a trait that has been recognized for a long time. This well-known clinical fact should always be borne in mind whenever the diagnosis of cystinuria or cystin stone is made, so that we may be on our guard, and examine carefully the urines of the other members of the family. In the two cases reported in this paper, we were fortunate to obtain urines from all of the rest of the family except the father, the results of which are mentioned above.

One of the most carefully studied and oft-quoted of these cystin families is the one reported by Abderhalden: "Kaufman in the autopsy of a 21½ months old child that had died of inanition found all the organs infiltrated with numberless white points. A section of the spleen given to Abderhalden for examination showed that the deposits were cystin. Two other children of the family died in the same way, a girl of 9½ months and a boy of 17 months. Two boys are still living and have cystinuria. The father's urine contains cystin, the mother's does not."

J. Cohn reported a family of cystinurics in 1899. The family consisted of twelve members. Two of these could not be examined. Of the remaining ten members, cystin was found in the urine of seven, the mother and six children. According to Cohn, this is the largest number reported in any one family. Two twins aged 10, had enormous amounts of cystin in the urine.

Strasser in a discussion of Brik's paper reported a family in which cystinuria and cystin stones were observed in almost all of the members in three generations.

A. Müller quotes Teall who saw it in five members of the same family; and Toel who reported the disease in a mother and two daughters.

E. Pfeiffer has reported four cases which occurred in two sisters and two brothers. The two children of the oldest sister have no cystin in their urines.

Lichtenstern reports two brothers, both suffering from cystin calculi.

Harnier has also reported the cases of two brothers, both suffering from cystinuria that sometimes increased to such an extent that gravel or small stones were passed.

A case of cystin calculus from a cystin family is reported by Winternitz.

The number of cystin families no doubt could be increased if care were exercised in studying these cases. In many of the reported cases the statement is made that other members of the family suffered from stone, nothing, however, being said as to the nature of the stones or the condition of the urine. There can be little doubt that a certain number of these cystin families have been overlooked in this way.

Bearing on the hereditary phase of this topic is an article by Southam. He reported the case of an unmarried female who was operated on for cystin stone in the kidney. She was the daughter of a woman operated on by Southam's father for cystin stone twenty-four years previously. Eight years after the mother was operated on her urine still showed cystin. The patient reported still has cystin in her urine, fourteen years after operation.

Occurrence of Cystin Outside of the Urinary Tract.

A. Occurrence in the Blood. Műller, as far as I know, has been the only one to report the occurrence of cystin in the blood. A peculiar point in his case was a "stubborn urticaria from December, 1902, to February, 1903." During this time the patient had moderate attacks of colic with discharge of small cystin concrements, and a cystin crystal was also found in the blood. This was given as a probable cause of the urticaria.

B. Occurrence in the Internal Organs. That cystin may be found in the internal organs is proven by the autopsy findings of Abderhalden. This, however, is a rare occurrence. Sherer found cystin in the liver of a drunkard who had died of typhoid. In Ultzman's case, the liver was carefully examined after death, but neither cystin nor taurin could be demonstrated in the liver, spleen or kidneys. According to Garrod, Kulz obtained it on one occasion among the products of pancreatic digestion *in vitro*

C. Metastatic Deposits of Cystin in Muscles of Chest. Umber and Bűrger reported an unusually interesting case in which the cystin was deposited in the right pectoral muscle. The patient had had a left-sided renal colic, associated with pus and blood in the urine. There was gradual disappearance of the blood and pus and of the kidney pain,

followed by fever and a hard wood-like infiltration of the right pectoralis region. In the urine were found small granules of cystin. No doubt the kidney colic with secondary infection was due to irritation by cystin concrements. The infiltration in the pectoralis region was due to cystin diathesis. The body tissues were supersaturated with the cystin, which is only slightly soluble. That it was due to the cystinuria is shown by the fact that when cystin was given by mouth, and when the meat diet was increased with consequent increased output of cystin, there was an acute exacerbation in the infiltration with rise of temperature. "On June 21st, the patient was discharged well. He returned on October 25th and a subpectoral abscess was opened. Eight days after the recurrence, cystin concrements reappeared in the urine, though they had been absent for months. With the healing of the abscess they again disappeared."

D. Occurrence of Cystin in Animal Tissues. Cloetta found cystin in the kidneys of an ox but failed to obtain it from other ox kidneys examined. Stromeyer stated that Lassaigne of Paris found cystic oxide in a stone from the bladder of a dog, and Dreschsel, according to Fowler, found it in the liver of a horse.

Varieties of Cystinuria.

Temporary cystinuria has been reported by Warburg, whose patient had a hemorrhagic cystitis. Transitory cystinuria has been reported by Simon and Lewis, associated with diaminuria.

One of the striking chemical characteristics of these stones is the fact that when found they are practically always pure cystin, with the exception of MacPhail's (1) case, in which the outer surface of the stone was cystin and the interior was phosphatic with a mulberry nucleus, and Ultzman's (2) second case, in which the nucleus was pure cystin, the rest of the stone consisting of earthy phosphates and calcium oxalate.

Duration of Cystinuria.

With the passage of, or the surgical removal of, the stones, it is interesting to note the effect, if any, upon the cystinuria. There seems to be no hard and fast rule about it. In other words, removing the stones is not always followed by a disappearance of the cystinuria. Thus Roberts, Schweig, Heath, Ultzman, Harrison, Cohn and MacPhail have recorded a disappearance of the cystin after removal of the stones. A persistence of the cystinuria after removal of the calculi was reported by Moreigne, Staathogen and Briger, Fowler, Swarsensky, Enwall and Southam. In one of Southam's cases the cystinuria was still present fourteen years after operation.

Occurrence of Diamines.

Various diamines, such as lysin, putresin, cadaverin, leucin and tyrosin have been reported occur-

ring in the urines of patients suffering with cystinuria or cystin stones.

Origin of Cystin.

A. Synthesis of Cystin. The interest in the chemistry of cystin was greatly stimulated when Mőrner showed that cystin could be obtained by the hydrolysis of hair. Two years later Embden obtained it by the hydrolysis of serum and egg albumin. Cystin has also been prepared from horn. This has been described by Mőorner.

B. Production of Cystin in the Body. Much remains to be desired in our knowledge of this part of the question. Many theories have been advanced and much experimental work has been carried out, but no definite views are held on this topic. The modern view seems to be that it is due to some error in metabolism.

According to Wells, the cystin that escapes in the urine in cystinuria is not derived from intestinal putrefaction, but is formed in the tissues from the protein molecule, and fails to be further decomposed because of some anomaly of metabolism. Wells further states that the metabolic error in cystinuria is not complete, for only a portion of the total cystin of the catabolized proteins is excreted as such (Garrod).

Moreigne concludes that cystinuria is a condition due to retardation of nutrition, caused by partial arrest of oxidation.

Bődtker does not accept the argument of Bauman and Udransky that cystin is a result of intestinal putrefaction, but concludes that it is an intermediary product of albumin metabolism in the body. He believes that the diamines are also intermediate products of albumin metabolism that are further oxidized in the normal body, but in the cystinuric this capacity for further oxidization is lost.

Abderhalden and Schittenhelm believe that cystinuria is probably due to a disturbance of intermediate albumin metabolism, which is as yet so little understood.

Garrod, who has made an extensive study of cystinuria, and after quoting various theories, says: "It is clear from all this that we are still far from being in a position to formulate a satisfactory theory of cystinuria. Obviously the anomaly is a very complex one of different range in different cases and even of distinct natures."

Garrod furthermore states that the varying extent of the error as regards the number of protein fractions involved in cases of cystinuria suggests that it is manifested at an early stage of the catabolic series, and concerns a mechanism which deals with a number of amino and diamino acids in common. Garrod thinks that cystinuria may be classed as an arrest rather than as a perversion of metabolism.

Ackerman and Kutscher stated that it is generally accepted now that the cause of cystinuria is a suppression of amino-acid catabolism.

Wolf and Shaffer give a detailed report of metabolism experiments in two cases of cystinuria, with tables showing their results. With reference to the origin of the cystin in the urine, they say "The cystin in high protein feeding is largely of exogenous origin, but a part is probably not derived from food protein. To what extent strictly endogenous processes play a part in its formation it is impossible to say."

Alsberg and Folin undertook the study of protein metabolism in cystinuria. The patient continued to eliminate cystin with the urine at the end of a thirteen-day feeding experiment with a diet containing practically no protein at all. They further stated that if the daily amount of cystin eliminated had been as great on the starch as on the protein diet, it would have been clear that the origin of the cystin is the sulphur coming from the body tissues. But the neutral sulphur values show that on the non-nitrogenous diet the cystin is absolutely diminished, and relatively to the total sulphur increase. The fact that the neutral sulphur remains greater than normal on a protein-free diet and relatively more prominent than on a protein-rich diet, taken together with the fact that the pure cystin does not pass through the system in unchanged condition, indicates clearly that the cystin which is eliminated is not absorbed as such from the intestinal tract. The facts would suggest rather that the food sulphur which is eliminated as sulphates may be absorbed as cystin and that it is the sulphur which is absorbed in large or different complexes, together with the sulphur derived directly from the tissues which the cystinuric individual is unable to convert normally into sulphates.

They conclude that in view of the inexplicable differences between their results and those of Loewy and Neuberg, it is useless to dwell on explanations and theories. What is needed is more facts.

Thiele reported a case of cystinuria in which he investigated the effects of abstinence of food, an almost pure carbohydrate diet, an excessive meat diet, the administration of tyrosin, and the administration of some of the patient's own purified cystin. He found that the amount of cystin excreted was practically independent of the diet. The patient was able to break up cystin administered by the mouth, even though it was cystin previously excreted by him, his tissues having been unable to break it up. He concludes that the amido-acids are not absorbed as such, but are denitrified by the intestinal mucosa and converted into the corresponding simple fatty acids before absorption. In cystinuria a defect may be present in the sulphur removing ferments, the denitrifying ferments, or both. The defect appears to be most usual in the tissues, but may also occur in the intestinal mucosal ferments.

From time to time the liver has been supposedly the organ at fault in cystinuria. Marowski's observation on the association of cystinuria with acholia

has been adduced as evidence pointing toward the hepatic origin of cystin.

Recent work by von Bergman has revived the hepatic origin, or at least resurrected this theory. He has shown that feeding cholic acid to dogs increases the amount of taurocholic acid in the bile for a time until the reserve supply of taurin-forming material has been exhausted, and that this material may be replenished by the administration of cystin, so that the secretion of taurocholic acid begins anew. On the other hand, feeding cystin alone does not increase the amount of taurocholic acid. The dog's organism has evidently a reserve supply of taurin, but none of cholic acid. In the light of this work, it is possible that cystinuria is a functional disease of the liver in which too little cholic acid is formed, so that but little sulphur is excreted in the bile as taurocholic acid. In the course of time this might lead to so great an accumulation of the precursors of taurin in the system that the kidneys are compelled to act vicariously for the liver by excreting cystin.

Having for his object the determination of the fate of cystin in the body, Blum administered cystin to animals in different ways, mouth and intravenously, in an attempt to find out how it was disposed of. He found that only small amounts could be catabolized when given intravenously, but that amounts far above the normal could be disposed of when given by mouth. A flooding of the intestine with cystin, even to the limits of toxicity, did not cause cystinuria. This, he stated, disposes of the theory of an abnormal catabolism of albumin in the intestine, producing so much cystin that it cannot be disposed of and so is excreted unchanged in the urine.

Delepine came to the conclusion that the deposition of cystin crystals was favored by the presence of an organism, probably one of the blastomycites. His work has not received confirmation.

Because of the presence of certain diamines in the urine and feces of cystinurics, Bauman and Udransky suggested a hypothesis in which they set forth views that cystinuria was due to intestinal putrefaction. This view is no longer held by modern workers in this field.

Diagnosis.

Very frequently one sees the statement that cystin stones cannot be demonstrated by means of the Roentgen ray. Although most of the cases were reported prior to the general routine employment of X-rays in urinary surgery, in those of more recent date in which the X-rays were used, one finds positive reports. So that their demonstration with X-rays is quite simple. Link (2 cases), Rumpel, Berg, Kretschmer (2 cases), Frankenthal and Lichtenstern have all reported positive X-ray findings in their cases. In the two cases reported above the diagnosis was made once by the Roentgen rays

and once by a cystoscopic examination, which was verified by a subsequent X-ray examination.

Treatment.

The treatment of cystin calculi must be considered under two headings:

1. The Calculi.
2. The Cystinuria.

The appropriate surgical measure to be instituted depends on the locality of the stone. When the calculi are in the bladder, litholapaxy is the operation of election. That it can be carried out is demonstrated not only by the two cases reported above, but by the reports of others. Usually, however, the calculi are small, and are passed spontaneously by the patients. This was recorded in forty-one cases.

The treatment for the cystinuria is unsatisfactory. Many of the cases fail to respond to any form of treatment.

DISCUSSION.

Dr. L. W. Bremerman: I should like to ask whether in the two patients operated on by you the cystinuria persisted. I have never had the fortune to see a cystin stone. I understand in some cases the removal of the stone will clear up the cystinuria. I want to know whether it has been so in these cases.

Dr. G. Kolischer: The question of cystin stones or cystinuria is very important from other points of view than those mentioned in the paper. Cystin stones belong to the group of stones that are used as an argument against the old Epstein theory that it is necessary for the formation of a urinary concretion that a skeleton must be provided first, and on this the deposit of urinary salts occurs, forming the calculus. We know that cystin stones are pure cystin. There is no combination with any other elements, so that we consider them prototypes of all primary stones; not due to inflammatory processes; not due to catarrhal conditions of the urinary tract; and not due to bacterial infection, all of which are considered as causes for deposits anywhere in the urinary tract. It is very interesting from this standpoint to show that on the Epstein theory cystin is a product of the incomplete metabolism of proteins. Cystin is a product of the decomposition of albumin in the metabolism of the body. Cystin is one of the unfinished body products of the incomplete metabolism of proteins, and consequently a product of metabolism and not a product of the genito-urinary tract in a direct sense. The proof is that in poisoning by phosphorus we find cystinuria. As long as there is poisoning cystinuria is maintained. This is interesting on account of the influence of phosphorus on the liver where the splitting up of the proteins takes place. It is a product of metabolism, for occasionally cystin is found in all the organs in deposits of various sizes. The finding of sulphur was mentioned by Dr. Kretschmer, as also that cystinuria runs in families. Epstein collected 65 cases. This opens up the possibility of rational therapy to prevent these concretions on the same plan as in diabetes, which originally was considered a kidney disease. As to therapy, it is possible to do a lithotripsy. In former years cystin stones were not removed in this way on account of the defective instruments. Nowadays with modern instruments we can crush the cystin stones. After they are caught we leave them in the grasp of the forceps for a few minutes and then find that they crush easily. Whether the theory of Epstein would hold in other cases is a question for discussion. The formation of a concretion in the urinary tract does not depend on the presence of an organic skeleton, but on a quick change in the concentration

of the urine. For instance, a flood of uric acid may produce a quick change and calculi may follow. Phosphatic and uric acid concretions are explained on the hypothesis that the skeleton was present and was taken in with the deposit due to the quick concentration of the urine.

Dr. D. N. Eisendrath: Two questions interest me: How does the intensity of the X-ray picture compare with that of other stones? We are usually taught that cystin stones give the lightest shadow of any of the calculi. What is your personal experience? In the second place, the question is brought up as to a matter that I am about getting ready to take hold of in an experimental way, namely, the formation of calculi and their reformation. There was an article by Cabot in the March *Surgery, Gynecology and Obstetrics* on the reformation of calculi. I called attention to this two years ago in a paper on bilateral calculi, in which I reported a case of my own and one of Dr. MacArthur's cases. In both cases, in spite of the fact that we had removed the calculi in two separate operations at intervals of one and three years, the calculi had recurred. It brings up the question of whether it is a disturbance of metabolism, or, as Dr. Kolischer has brought out in the theory of Kleinschmidt and Aschoff, concentration of the urine with or without the question of infection. Now this is something of the utmost importance at the present time to the surgery of the urinary tract. It has got to be such an important thing that in my own cases whenever I operate on a patient for ureteral or renal calculus I cannot assure them if they ask me the question, "Is the stone going to come back?" I cannot assure them of that fact, because as long as this peculiar tendency in the metabolism of the patient is present, as it was present in our cases, occurring with or without infection—being specially favored by infection—we are never sure but what they will recur. We had recently an instance of that. Three years ago I took a small stone from the parenchyma of a kidney. The patient came back again and Dr. Kolischer saw him. The X-ray picture showed a very faint shadow of a stone filling out, apparently the renal pelvis. A year or two later another picture showed an intense shadow, showing how the stone was becoming more and more dense. This whole question is no longer a theoretical one, but a very practical one. When I presented this case of bilateral urinary calculi a surgeon suggested that if I give the patient nothing but distilled water to drink he would never have a recurrence. We know this is not so. It is some factor we cannot understand at the present time. We see it in cystitis, in the phosphatic deposits in ammoniacal cystitis, how these deposit themselves on the walls of the bladder and recur and recur until we get rid of the infection. The whole question brought up by cystinuria of the tendency to recurrence is one of great interest to me.

Dr. H. L. Kretschmer: In reply to the question of Dr. Bremerman as to whether or not these patients still have cystinuria, it was my intention to have these patients send in urines, but I did not do it. When the paper is published I shall report that fact, because that is an important fact to determine—whether or not the cystinuria persisted long in these two cases. Answering Dr. Eisendrath's question about the X-ray pictures, I wanted to bring them along but forgot them. The shadows were very distinct—just as intense and easy to see as any other shadows. The only other illustration I recall was one by Rumpel, and in this case it was distinct. In one of my cases the urine culture was sterile, and in the other a pure culture of colon was found. I agree with Dr. Eisendrath in regard to the distilled water. I have seen two cases of recurrent stone in which the patients drank only distilled water. In both cases stones had reformed, so that I do not think distilled water had any real effect on preventing a recurrence of the stone formation.

Recent examination of the urines show that the cystinuria in one patient has completely disappeared, whereas the other patient still has his cystinuria.

Abderhalden and Schittenhelm. *Zeitschr. f. physiol. Chem.*, 1905, XIV, 468.

Abderhalden and Schittenhelm. *Zeitschr. f. physiol. Chem.*, 1903, xxxviii, 557.

Ackermann. *Deutsch med. Wochenschr.*, 1913, xxxix, 1020.

Ackermann, D. and Kutscher, F. *Zeitschr. f. Biol.*, 1911, LVII, 355.

Alsberg and Folin. *Amer. Jour. of Physiology*, 1905, XIV, 54.,

Alsberg, Carl L. *Jour. Med. Research*, 1904, XIII, 105.

Bartels. *Virchow's Arch.*, 1863, CXXVI, 419.

Bary. In Beale, Urine, urinary deposits and calculi. 2nd ed., Lond., 1864, page 354.

Bennett. *Trans. Path. Soc. of Lond.*, 1850-52, III, 383.

Berg. *Verhandlungen. d. Deut. f. Urologie*, IV, Congress, 1913.

Bird. Urinary Deposits. Philadelphia, 1863, pp. 174-178.

Biscons. *Toulouse med.*, 1909, XI, 26-32.

Blum. *Beitr. z. Chem. Physiol. u. Path.* 1903-04, V. 1.

Bley. *Buchner's Reporter*, 1835, LVII, p. 65.

Bödtker. (*Beitrag. zur Kenntnis der cystinurie. Zeitschr. f. physiol. Chem.*, 1905, XIV, 393.

Bowlby. *Trans. Path. Soc. of Lond.*, 1888-1889, XL, 182.

Buchner. *Buchner's Reporter*, 1825, XXI, 113.

Brande. *Quart. Jour. of Science, Literature, Arts*, Lond., 1820, VIII, 66.

de Bruine Ploos Van Amstel, P. J. *Samml. klin. Vortr.*, 1910, Nos. 562-564, page 194.

Brik. *Mitt. d. Ges. f. inn. med., Wein.* 6 Marz, 1902.

Cammidge, P. J. *Lancet*, 1901, II, 592.

Cammidge, P. J., and Garrod, A. E. *Jour. of Path. and Bacteriol*, 1900, VI, 327.

Cantini-Cystinuria, Obesity & Gall Stones. Trans. from Italian by S. Hahn, Berlin, 1881, p. 18.

Chabrie. *Ann. d. mal. d. org. gen-ur.*, 1895, XIII, 236; 317.

Church. *Trans. Path. Soc. of Lond.*, 1869, XX, 240.

Civiale. Medical Treatment of Stone.

Cloetta. *Liebig's Ann.*, 1856, XCIX, 299.

Cohn, J. *Berl. klin. Wchnschr.*, 1899, XXXVI, 503.

Czapek. *Prager med. Wchnschr.*, 1881, p. 544.

Delépine (*Proc. Royal Soc.*), 1890, XLVII, 198.

Des Mouliers. *These de Paris*, 1910-1911, No. 328.

Ebstein. *Deutsch. Arch. f. klin. Med.*, 1879, XXIII, 138.

Ebstein. Reported by A. Niemann. *Deutsch. Arch. f. klin. Med.*, 1876, XVIII, 232.

Ebstein. *Deutsch. Arch. f. klin. Med.*, 1881, XXX, 594.

Enwall. Axel; Case reported by Santeson, *Hygeia*, 1874, XXXVI, 272.

Fina Lyson. *Brit. Med. Jour.*, 1881, I, 968.

Fischer and Suzuki. *Zeitschr. f. Physiol. Chem.*, 1905, XLV, 405-411.

Fowler. *Johns Hopkins Hospital Reports*, 1906, XIII, 557.

Frankenthal, Ludwig. *Deutsch. Zeitschr. f. Chir.*, 1914, CXXXI, 442.

Fromherz. K. Cystinuria. *Berl. klin. Wchschr.*, 1913, L. 1618-1620.

Gamgee. *Lancet*, 1901, I, 470.

Garrod, A. E. Inborn errors of Metabolism. Lond., 1909, pp. 82-135. Cystin.

Garrod and Hurtly. *Jour. of Physiol.*, 1906, XXXIV, 217.

Gaskell, J. F. *Jour. of Physiol.*, 1907, XXXVI, 142.

Gaujot. *Progrès Méd.*, 1878, VI, 184.

Gilbert, G. A. *Chicago Clin.*, 1900, XII, 177.

Gross, W. Sitzungsber. *Gesellsch. f. Morphol. u. Physiol.*, 1908, XXIV, 97-101.

Grutterink. A. Nederl. *Tijdschr. V. Geneesk.*, 1913, LVII, I, 1877.

Hall. *Quarterly Med. Jour.*, 1894, p. 26.

Harnier, W. In Neubauer and Vogel: *Analyse des Harnes*, 1876, 7th ed.
Harrison, Reginald. *Brit. Med. Jour.*, 1879, II, 10.
Heath, C. *Brit. Med. Jour.*, 1875, II, 613.
Hele, T. Shirley. *Jour. of Physiol.*, 1909, XXXIX, 52-72.
Heller, John. *Urinary Concretions* (*Harnconcretionen*) Wien, 1860, pp. 67 and 145.
Himmelstjerna, *Berl. klin. Wchnschr.*, 1899, XXXVI, 446.
Hodann-Müller. *Günsburg's Zeitschr.*, 1851, II, 264.
von Hofmann, Karl. *Centralbl. f. d. Grenzgeb. d. Med. u. Chir.*, 1907, X, 721-730; 769-776.
Hugounenq. *Lyon Med.*, 1911, CXVII, 913.
Ivanchich. *Wien. Med. Wchnschr.*, 1869.
Jacobson, W. H. A. *Trans. Clin. Soc.*, 1891, XXIV, 155.
Jeanbrau, E. *Assoc. franc. d'urol.*, 1912, XVI, 688.
Johnson in Beale. Urine and Urinary Deposits and Calculi. 2d Lond., 1864, p. 354.
Jones, Bence. *Trans. Path. Soc. of Lond.*, 1848-50, II, 237.
Kleinschmidt, Otto. Urinary Stones. Berlin-Springer, 1911.
Klemperer, G. and Jacoby M. *Therap. d. Gegenw.* 1914, 101-103. Abst. in *Jour. A. M. A.*, 1914, LXII, 1207.
Külz. *Zeitschr. f. Biol.*, 1884, XX, I.
Küttner, Herman and Weil, S. *Bietr. Z. klin. Chir.*, 1909, LXIII, 364.
Lafleur, H. A. *Phila. Med. Jour.*, 1898, I, 910.
Lamy. *These de Nancy*, 1911.
Leo. *Zeitschr. f. klin. Med. Jour.*, 1889, XVI, 325.
Lenoir, cited by Civale, p. 452.
Leroy. (*d'Etoiles*) *Bull. de la Soc. d'anat. de Paris*, 1862, VII, 331.
Lewis, M. W. and C. E. Simon. *Amer. Jour. of the Med. Sc.*, 1902, CXLIX, p. 832.
Loebisch, W. F. *Liebig's Ann. d. Chem.*, 1876, CLXXXII, 231.
Loewy and Neuberg, C. Cystinuria, *Zeitschr. f. Physiol. Chem.*, 1904-05, XLIII, 338.
Lichtenstern. *Wien. klin. Wchnschr.*, 1903, No. 18.
Loumeau. *J. de Med. de Bordeaux*, 1909, XXXIX, 795.
Link, Rudolph. Cystinuria and Cystine Stones. Di-ss., Leipzig, 1912.
MacPhail. *Brit. Med. Jour.*, 1881, I, 968.
Magendie. *Research Phys. et Med. sur les causes de la Gravelle*, 2d. ed., Paris, 1818.
Manby, F. E. Cystine. *Brit. Med. Jour.*, 1875, I, 58.
Marcet. Essay on the Chemical History and Medical Treatment of Calculous Disorders. 2d ed. Lond., 1819.
Marowsky. *Deutsch. Arch. f. klin. Med.*, 1868, IV, 449.
Marriot and Wolf. *Amer. Jour. of Med. Sci.*, 1906, p. 197.
Matrai. *Pester Med. u. Chir. Preese*, 1886.
Mester. *Zeitschr. f. Physiol., Chem.*, 1890, XIV, 109.
Moreigne, Henrie. *Arch. de Med. exp. et d'anat Path.*, 1899, XI, 254.
Mörner. *Zeitschr. f. Physiol. Chem.*, 1899, XXVIII, 595.
Mörner, K. A. H. *Zeitschr. f. Physiol. Chem.*, 1901, XXXIV, 207.
Morris, H. *Lancet*, 1906, II, 141.
Müller. *Arch. f. Pharm.*, 1872, LI, p. 308.
Müller. *Wien. Med. Wchschr.*, 1911, LXI, 2363; 2487.
Neill, Hugh. *Lancet*, 1831-1832, I, 411.
Neuberg & Mayer. *Zeitschr. f. Physiol. Chem.*, 1905, XLIV, 472.
Neumann. *Berl. klin. Wchschr.*, 1914, LI, 1294.
Ord, W. M. *Trons. Path. Soc. Lond.*, 1879-1880, XXXI, 384.
Percival, Alberto. *Clin. Med. Ital.*, 1902, XLI, 50.

Pfeiffer, Emil. *Centralbl. f. d. Krankh. d. Harn-und Sexualorgane*, 1894, V. 187.
Pfeiffer, Emil. *Centralbl. f. d. Krankh. Harn-und Sexualorgane*, 1897, VIII, 173.
Picchini and Conti. *Sperimantale*, 1891, *No.* 17. *Abstr. Centralbl. f. klin. f. Med.*, 1892, XVIII, 629.
Pollatschek. *Mitt. d. Gessell. f. Inner. Med. Wien. Marz.*, 6-1902.
Prout. Nature and treatment of stomach and Urinary affections. 3d, ed. Lond., 1840.
Reid, John. *N. Y. Med. Jour.*, 1901, LXXIII, 666.
Riegler. *Wien. med. Blatter*, 1904, No. 3. Abstr. *Biochem. Centralbl.*, 1904, II, 373.
Rindfleisch. *Münich, med. Wchnschr.*, 1912, LIX, 2250.
Roberts. Urinary and Renal Diseases. 4th ed., Lea Bros., 1885, p. 111.
Rothera, C. H. *Jour. of Physiol.*, 1904-05, XXXII, 175.
Roberts, William. *Med. Times and Gazette*, 1858, XVII, 626.
Rumpel. *Archiv. und Atlas der Normalen und Pathologischen Anatomie.*
Saxl, Paul. *Zeitschr. f. exp. Path. u. Therap.*, 1913, XIII, 326. *Fortschnitt auf d. gebiete der Roentgenstrahlen Ergänzungsband*, 10, p. 39.
Scherer. *Jahresber. f. Chem.*, 1857, 561.
Schőlberg, W. A. and Garrod. *Lancet*, 1901, II, 526.
Schossberger. *Würtemberg Correspondent*, 1857, XXII.
Schweig. *Med. Ann., Heidelberg*, 1848, p. 364.
Ségalas. Essay on Gravel and Stones. 2d ed., 1839, p. 85.
Schattock. *Trans. Path. Soc., Lond.*, 1879-1880, XXXI, 183.
Simon, C. E. Campbell D. *Johns Hopkins Hosp. Bull.*, 1904, XV, 365.
Simon, C. E. *Amer. Med. Jour. Sc.*, 1900, CXIX, 39.
Smith, W. G. *Practitioner*, 1898, LX, 475.
Sondern, F. *Arch. of Diagnosis*, 1911, IV, 267.
Southam, F. A. *Brit. Med. Jour.*, 1876, II, 817.
Southam, F. A. *Brit. Med. Jour.*, 1907, I, 489-490.
Stadthagen. *Virchow's Arch.*, 1885, C. 416.
Stadthagen, M. and Brieger. *Berl. klin. Wchnschr.*, 1889, XXVI, 344.
Stromeyer. *Ann. of Philosophy*, 1824, VIII, 146.
Swarsensky. *Deutsch. med. Wchschr.*, 1899, XXV, 255.
Strasser. See Brik.
Thiele, F. H. *Trans. Path. Soc. of Lond.*, 1906-1907, LVIII, 255.
Thiele, F. H. *Jour. of Physiol.*, 1907, XXXVI, 68.
Toel, F. *Ann. der Chem. u. Pharmacie*, 1855, XCVI, 247.
Thompson, H. *Trans. Path. Soc. of Lond*, 1870, XXI, 272.
Thorndike, P. and Ogden J. *Bost. Med. and Surg. Jour.*, 1898, CXXXVIII, 367.
Udranszky, L. V. and Baumann, E. *Zeitschr. f. Physiol. Chem.*, 1889, XIII, 562.
Umber, and Bürger, M. *Deutsch. med. Wchnschr.*, 1913, XXXIX, 2337.
Venables, R. *Quart. Jour. of Science, Literature and Arts*, 1830, p. 30.
Warburg. *Münch. med. Wchnschr.*, 1898, XLV, 766.
Wasserthal. *Centralbl. f. Harn-und Sexualorgane*, 1904, p. 121.
Wells, H. G. *Chem. Path. Phila.*, 1914.
Whitney, W. F. *Bost. Med. and Surg. Jour.*, 1879, CI, 23.
Williams, H. B. and Wolf, C. G. *Jour. Biol. Chem.*, 1909, VI, 337.
Willis. Urinary Diseases and Their Treatment. Lond., 1838, p. 109.
Winternitz. *Prag. Med. Wchnschr.*, 1910, XXXV, 64.
Wolf, C. G. and Shaffer, P. A. Protein Metabolism in Cystinuria. *Jour. Biol. Chem.*, 1908, IV, 440.
Wollaston, W. H. *Philos. Trans.*, Lond., 1810, 223.
Wood, E. S. *Bost. Med. and Surg. Jour.*, 1879, CI, 4.

PRIMARY ADENO-CARCINOMA OF THE KIDNEY.*

By J. S. Eisenstaedt, S. B., M. D., Chicago, Ill.,

Associate Genito-Urinary Surgeon Michael Reese Hospital.

The literature is replete with reports both of clinical nature and histologic research of primary cancer of the kidney. However from the earliest data at my disposal, the inaugural dissertation of Hullman at Halle, published in 1849, to those of very recent date, I have been impressed by the seeming confusion existing in the histo-pathologic reports made.

Primary carcinoma of the kidney is included in the subject material in all the standard pathologies but detailed description is lacking as far as I was able to determine. The tumor which we have under consideration is an atypical proliferation of the secreting cells of the kidney, in many places showing exquisite papillary structure and as such can, I believe, only be considered as a carcinoma of adenomatous type.

The confusion in the literature is so evident that detailed infringements against what is correctly termed carcinoma of the kidney are unnecessary to this discussion. Suffice it to say that hypernephroma, that tumor whose place is still so indefinite in pathology, is unquestionably the most frequent lesion which has been incorrectly classed as carcinoma renis. Papilloma as well as the embryonic mixed tumor, or kidney blastoma, otherwise termed adeno-sarcoma, of Birch-Hirschfeld have repeatedly been described under cancer, the latter usually as carcinoma of the kidney in childhood. French authors particularly have been active in describing two types of "*epitheliome du rein*"—one "*á cellules claires*" and the other "*á cellules sombres,*" which are unquestionably both hypernephromata. Albarran and Imbert in their book "*Tumeurs du Rein*" published in 1903, emphasize the confusion in diagnosis as does Kelynack. It is not my intention to attempt to clarify the very turbid ideas of histology relevant to kidney tumors and particularly concerning carcinoma, neither shall I enter into a discussion of the origin of hypernephroma, with which carcinoma is so often confused. One might mention in passing, however, that while Stoerk's ideas are beginning to get a foothold here in America, the pathologists of Austria and Germany have almost all come to the conclusion that Grawitz's theory of their origin is the more tenable.

As regards the occurrence of primary carcinoma of the kidney, Garceau, in the opening chapter of his book, states that carcinoma of the pure type

*Read before the American Urological Association, North Central Section, Chicago, November 12th, 1915.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, February, 1916.]

is very rare and that the tumor most often found in the kidney arises from suprarenal rests. In going over the reports of the Massachusetts General Hospital he found in the ten years preceding 1909, hypernephroma noted thirty times, adenoma four, carcinoma three and sarcoma twice. Young reports but one case from the files of Johns Hopkins Hospital. The Mayo clinic reports three cases in the past ten and one-half years. McConnell in a statistical report on deaths from carcinoma in the United States does not cite a single instance. Some of the older reports of its occurrence are, from my viewpoint, absolutely unreliable, however, statistics have been compiled by Feilchenfeld in 1901—Reicheman in 1902, and Redlich in 1907. Israel stated that the tumor is found more often in the upper pole of the right kidney. Reiche and the Mayos have stated that malignancy of the kidney is dependent upon the occurrence of nephrolithiasis and in fact a small stone was found in one of the calices in the kidney under discussion and showed plainly in the Roentgen plate. Men are more frequently affected than women, and the few authentic cases occurred in patients between forty and sixty years of age. Our case, as you may see from the specimen, is the right kidney from a man forty-nine years of age. The patient had noted hematuria four years previous to operation, which was not accompanied by pain nor by any other general symptoms. Thereafter, at irregular intervals, there would be a recurrence of blood in the urine, at times the free intervals lasting from several months to a year. Two years before entering the hospital he again had a severe attack of hematuria and at this time complained of a burning pain in the penis during urination, and a dull pain in the right lumbar region, never colicky in type. From then on till his operation his condition became gradually worse, the free intervals being reduced to weeks and the occurrence of bloody urine lasting from four to ten or twelve days. This history suggests to me that the appearance of the small stone in the kidney, in all probability, followed the outset of the tumor, and probably was dependent upon the presence of the tumor rather than the reverse. The patient's family and personal history aside from the condition in hand, is entirely negative.

Urinalysis as follows on repeated examinations:

Color—Straw.
Specific Gravity—1020-1028.
Albumen.
Sugar—Negative.
Casts—Negative.
Cells—5-12 leucocytes to high-power field.
Few erythrocytes.

Gross Pathology.—The kidney measures twelve centimeters in length, six centimeters in width and four centimeters in thickness, the whole organ is of a purplish red color, due to a marked passive congestion. The contour of the kidney as a whole

is regular and normal, with the exception of distinct fetal lobulations and a tumor nodule, measuring four centimeters in diameter, situated in the middle of the convexity and projecting on an average of one-half centimeter above the normal surface. This nodule has a light yellow color but the injected renal capsule covering it, lends a brownish red shade to it. Fine striae and elevations are noted on external surface of the whole organ, evidently due to secondary contraction. On median sagittal section the contour, markings of cortex and medulla and thickness are normal. There is marked passive congestion. The pelvis is slightly dilated,

Fig. 1.

Magnification 75 diameters, showing the papillary structure of a portion of kidney tumor. Note that the tubuli show no hyperplastic changes.

and the mucosa seems fatty and distinctly edematous. A small stone three-fourths centimeters in diameter is lodged in one of the calices. On section of the tumor itself it was found to be roughly round in contour. The consistency is less firm than is common in carcinomata in general. It is uniformly yellow in color except at the periphery where hemorrhages had occurred. These later areas are yellowish red in color and present striae. The median quadrant of the tumor mass invades the pelvis. The minute pathology of the tumor is to me, at least, particularly interesting. As you will note from the photo-micrographs the adenomatous or

papillary structure is striking in certain areas, while in other the cells are arranged in massive, compact aggregations. The photo-micrograph showing the renal pelvis demonstrates to the left the massive arrangement of the carcinoma cells and from this area the higher magnification of two hundred and thirty diameters was made, while to the extreme right the tumor just where it is breaking through the pelvic epithelium shows the fine papillary structure. The submucosa of the pelvis is greatly thickened. The papillæ are characterized by very slight amount of supporting stroma and each is pierced centrally by a capillary. The immediate vicinity

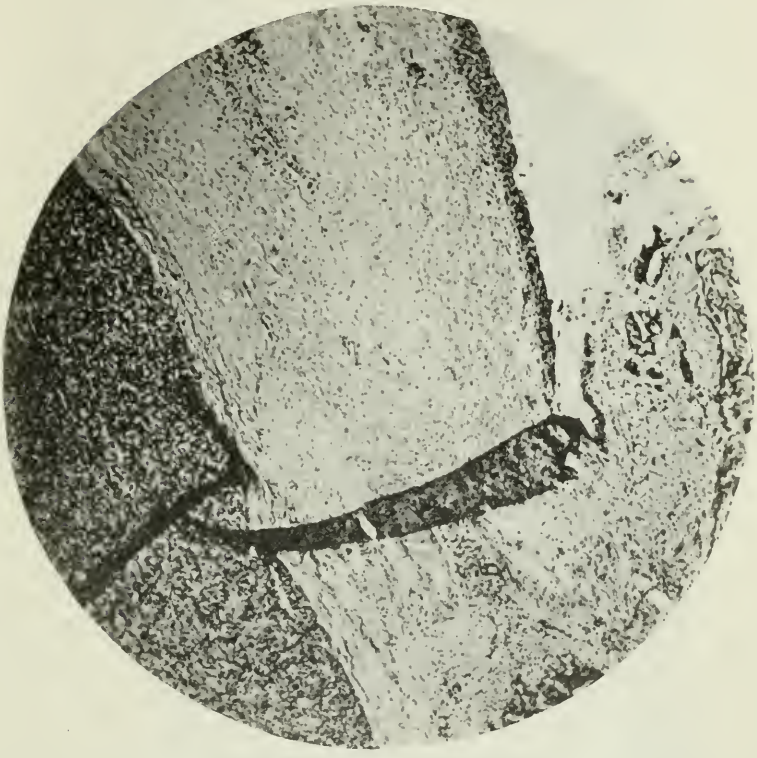


Fig. 2.

Magnification 70 diameters, showing, from left to right, massive arrangement of carcinoma cells, edematous submucosa of renal pelvis and to the extreme right, papillary arrangement of cells and breaking through of pelvic epithelium.

of the papillary portion of the tumor shows beautifully the apparent transformation of the normal kidney histology to carcinoma. Some of the glomeruli are but slightly changed, some show changes of hyperplastic character and still others chronic fibrous retrograde changes. In those showing hyperplasia, this is of varying degree and affects both the lining and secreting cells. In those with retrograde changes, the fibrosis of Bowman's capsule is present in all degrees of advancement. Some of the glomeruli are entirely replaced by fibrous tissue. In some of the glomeruli in the zone nearest the tumor

hyperplastic changes are noted in the tufts, presenting all gradations from practically normal glomeruli to tumor acini. The cells themselves demonstrate marked pleomorphism, some are large, swollen and show mitotic figures in the nuclei. The scantiness of supporting stroma is again noted to be striking. The cells covering the papillae are, for the greater part, what might be termed a high cuboidal type and resemble closely those covering the glomerular tufts. They have well defined nuclei and often nucleoli. The cells making up the more solid part of the tumor are similar save that there is a greater proportion of protoplasm to nucleus. They show practically no affinity for the

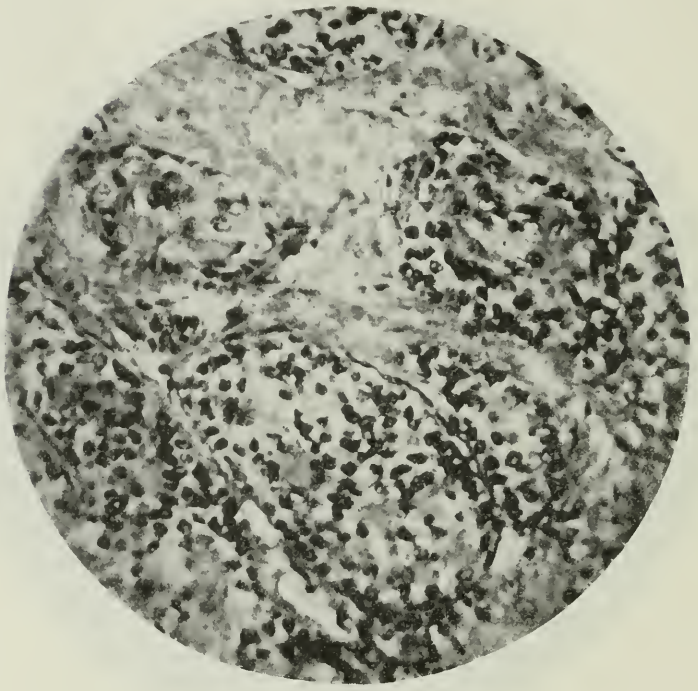


Fig. 3.

Magnification 230 diameters from the more solid portion of the tumor. Note lymph vessel plugged with carcinoma cells, pleomorphism of cells and mitotic figures in nuclei and degenerated renal tissue.

special fat stains. Their glycogen content as determined by the Iodin test is very small. The uriniferous tubules, straight and convoluted show no transitional changes. The higher magnified photomicrograph, taken from the more solid part of the tumor, shows very nicely a lymph vessel plugged with carcinoma cells. Watson and Cunningham in figure 381 of their book show a very similar tumor with almost identical papillary structures, while a photo-micrograph of the same tumor under higher magnification might readily be substituted for the one I have just described. Their illustrations are of a kidney tumor in the pathological department at the Boston City Hospital.

Two types of carcinoma of the kidney are described by various authors, the nodular and infiltrating, the latter especially by Rokitansky. Albarran in his enormous experience stated that he had never seen one of the infiltrating type.

As to the origin of these tumors our case suggests that they may arise from the glomeruli and such a case has been described by Abram in the *Journal of Pathology and Bacteriology*, Edinburgh, Volume VI, page 384. Others are of the opinion that they arise only from the uriniferous tubules. Manasse and Lissard for example have stated that they were able to show that the tubules became carcinoma strands, and their drawings are almost convincing. Newman in 1896, says that in the neighborhood of the advancing tumor the epithelium of the uriniferous tubules had taken on proliferative changes, that instead of being granular it was clear, and that the tubules were lined with several layers of cells. (He quotes Pereverseff who apparently started the idea that carcinoma renis must develop from the uriniferous tubule.) Pereverseff, however, while publishing on carcinoma, has actually described a retroperitoneal tumor which secondarily involved the lymphatics of the kidney as shown by von Recklinghausen, Weichselbaum and Greenish also state that carcinoma of the kidney arises from the normal parenchymal epithelium, and transition of the uriniferous tubules into carcinoma. Waldeyer and Thiersch agree with the above. Lissard found changes in the straight tubules as well as in the tubuli contorti and concluded that in his case the tumor arose from both. The glomeruli, he says, show little of interest. Hektoen, of this city, in the American Text Book of Pathology, says that cancer of kidney may develop from tubular epithelium as adeno-carcinoma. While this discussion is of course of academic interest it would lead us too far to quote other expressions of opinion regarding their histogenesis. However, the following note recently came to my notice, that in the examination of hundreds of kidneys of cats and dogs, 50 per cent. showed proliferation of the epithelium of the tubuli contorti into the capsule of the glomerulus and this may be readily imagined by glancing at the normal histology of the secreting apparatus. That carcinomata may arise from the minute adenomata, so often found in kidneys showing secondary contraction is quite generally accepted. Orth says "*auch an der niere besteht keine scharfe Grenze zwischen adenomen and carcinomen, denn man sieht in manchen Geschwulsten, neben Drüsenschläuchen mit lumen, solide Kolben und Zellhaufen in die Alveolen eingelagert, also nicht mehr das Bild eines Adenoms sondern das, des Carcinoms.*" Stoerk goes still further and states that all epithelial tumors of the kidney, from the small multiple adenoma to the Grawitz type are variations of the same process and neoplastic development. Legueu says that adeno-carcinoma

shows the transformation of a benign tumor into a malignant one and also the possibility of renal epithelium to transform itself into carcinoma. The papillary arrangement is dependent upon cyst formation, however minute. Von Hanseman says that the primary cyst develops from a uriniferous tubule or Bowman's capsule and the papillae about small blood vessels. The fact that any cyst formation in the kidney as well as elsewhere may lead to papillary growths has been noted repeatedly in careful studies of congenital cytsic kidneys. The patient was operated by Dr. Kolischer, to whom I am indebted for the specimen, on March 9, 1915, and left the hospital on March 22, 1915, in good condition. He has been in good condition to the present date. The life expectancy in these cases following operation is usually short because rarely a diagnosis is made before metastasis has occurred. In the three cases operated at the Massachusetts General Hospital one survived twenty-two days, a second four months and the third one year. Albarran in his enormous experience only operated two early cases, one of the kidneys removed showed no visible nor palpable deformity but on section a small carcinoma appearing like a focus of tuberculosis. The other case had been operated for stone when Albarran noted a slight elevation from the niveau. On section a small vascular non-encapsulated tumor was exposed which invaded the parenchyma and was the size of a cherry.

In conclusion, this case presents several points of interest—first, the long duration of hematuria not accompanied by pain or other general symptoms, then followed in two years by pain associated with hematuria probably due to the small stone found in one of the calyces. Secondly, the general well-being of the patient seven months after operation. Thirdly, the rather unusual histo-pathology suggesting that the tumor arose from the glomeruli rather than the uriniferous tubules. Fourth, its rarity as suggested by the scant reports of authentic cases in the literature.

The tumor is not a malignant papillary adenoma of the type described by Sudeck, Bentley Squier, Kretschmer and myself, nor can it possibly be confused with tumors of the Grawitz type.

DISCUSSION.

Dr. H. L. Kretschmer: The patient we reported a year and a half ago, and to whom Dr. Eisenstaedt referred, occurred in a young man of 19. The specimen was obtained at post-mortem. The patient had among many other interesting things a large deposit of lime salts which gave a shadow which resembled the presence of a large stone. Our specimen showed infiltration with lime salts in the old parts of the tumor as well as in the metastases. I have never seen reports of these general lime deposits in these rare types of tumors.

I do not believe I understood Dr. Eisenstaedt. Did you say the tumor was an adenocarcinoma, but of the papillary type?

Dr. D. N. Eisendrath: The specimens are of unusual interest. They show, as he said, that they are not malignant

adenoma of the papillary type; that they are primarily adenocarcinoma. There are a number of interesting features about the cases. The clinical point about the intermittent hematuria is of great interest. Why these tumors should at times open into the pelvis of the kidney and then close again is of considerable importance as far as the diagnosis is concerned. I had this past summer an enormous hypernephroma in which at no time had any hematuria been present. There was another symptom that I had met for the first time, namely, that every time this patient had a hemorrhage—we did not know what had taken place until the autopsy—he had a reflex renal ileus,—enormous distension of the abdomen, vomiting, pain-symptoms that looked like typical impacted stone in the ureter. I will report the case this coming winter as one of reflex renal ileus. They are sometimes taken for appendicitis or intestinal obstruction. At autopsy about two-thirds of the hypernephroma was found to be composed of blood clot.

Another point was brought out by Dr. Kretschmer and Dr. Eisenstaedt that we must take into consideration in the differential diagnosis renal shadows. I saw this last spring a marked case at the Jefferson, and also again Dr. Louis Schmidt had a case from Kansas City, namely, calcification taking place in a malignant tumor, simulating the shadow of a recent calculus.

In regard to the origin of these tumors, from the glomeruli or the tubules, I do not know whether you know of the work of Berner of Copenhagen, who has written a volume on cystic kidney, and his views are beginning to be accepted, that congenital cystic kidneys are due to the fact that there is a failure of union of portions of the kidney which are to form the glomeruli and the collecting tubules; that the collecting tubules are formed from ingrowths of the ureter and that these are primarily deposits of embryonal cells which do not meet each other, with cyst formation. It seems plausible. It seems to me about as likely a theory to explain these primary adenocarcinomata as we can think of. Instead of being retention, some one portion of the kidney has not united with its distal portion and has undergone proliferation and the formation of an adenocarcinoma. The case is certainly of great interest, and I think we all feel indebted for such a thorough presentation of it.

Dr. Eisenstaedt (in closing): The reason for my attempt to go thoroughly into the histopathology of this case is the fact that several years ago while working with Professor Pick of Berlin I had the opportunity of studying and reporting a malignant papilloma of the kidney in which the papillae were clothed with a single layer of cells throughout. The many metastases present in this case also demonstrated that the papillae therein were likewise covered with but a single layer of cells. Histopathologically one could not differentiate it from a benign tumor. Clinically it of course was extremely malignant and presented widespread metastases. This is in marked contradistinction to the case under consideration this evening which is so plainly carcinoma. The origin of the tumor is interesting. If one bears in mind the histology of the secreting apparatus one will see that the slight displacement of any of the cells and the stimulous to a wild proliferation would entangle the matter even worse than it is at present and leave us in the dark as to its origin.

RADIOTHERAPY AND DIATHERMY IN MALIGNANT TUMORS OF THE BLADDER.*

By G. Kolischer, Chicago, Ill.,

Attending Surgeon to the Genito-Urinary and Radiotherapeutic Department of the Michael Reese Hospital in Chicago.

It seems that now the radiotherapy of malignant bladder tumors and its auxiliary forces may be practiced and developed along well defined lines. We are now in possession of tangible results, the analysis of which indicates certain directions.

It may be stated right now that the X-rays though filtered and penetrating are without any definite curative value. Generally the effect of the X-rays will be a certain cleaning up, that is the cystitis usually accompanying the presence of a malignant tumor will disappear, a sick tumor will acquire under their influence a less angry appearance, hemorrhages and pains will subside for some length of time. But in no instance could a disappearance or even an appreciable shrinkage of the growth be observed.

It seems also very doubtful, whether the exclusive application of X-rays is of pronounced value in preventing recurrence after a resection of the bladder for malignancy.

The endovesical application of mesothorium, however, furnishes results of an entirely different character. We are having now on our records, four cases of inoperable cancer of the bladder to attest to this statement.

In three of these cases we are in a position to verify our results by repeated local examinations, while in the fourth case on account of the patient's attitude the verification of the improvement attained can only be gleaned by clinical observation.

The first case to be recited was turned over to the department by L. E. Schmidt, as cancer occupying practically the whole lower half of the bladder about eleven months ago. Under mesothorium treatment rapid improvement set in so that a cystoscopy undertaken by Schmidt seven months ago revealed the bladder positively clear save for a little papillomatous nodule near the left ureter. This was fulgurated by the doctor. A cystoscopy executed a few days ago showed the bladder to be absolutely normal, no trace of any pathology. The next case also coming out of the practice of Schmidt was a cancer of the trigonum involving the whole circumference of the internal orifice. First mesothorium treatment eight months ago. A cystoscopy made by me and Schmidt's associate four weeks ago revealed the bladder free save for a

*Read before the American Urological Association, North Central Section, Chicago, November 12th, 1915.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, February, 1916.]

nodular but epithelialized tumor of the size of a pigeon's egg in the left border of the trigonum. The general condition of the patient is now excellent. The third case is a trigonal cancer growing out of the bed of a removed prostate. Two months ago the patient began to be distressed by bloody dysuria and pains. It was impossible to pass any instrument through the posterior urethra. Suprapubic cystotomy was resorted to and the diagnosis of an extensive cancer of the trigonum was established. Mesothorium treatment resulted in making the bladder basin smooth and at the present time French 27 may be easily passed. Our intention is to let the abdominal fistula close up and to continue the treatment per urethram.

The fourth case, again one of Schmidt's, had an extensive cancer of the trigonum with very distressing subjective symptoms. Mesothorium improved the patient locally and generally to such an extent that he not only refused further treatment but even an examination.

For application per urethram the Mesothorium is enclosed in a gold filter, for application through a suprapubic opening it is placed in a silver or brass container.

In order to give the patient all the benefit of the appliances at our command we are using the mixed crossfire, that is the patient is also treated with filtered X-rays abdominally while the Mesothorium is still inside of the bladder or shortly after the Mesothorium application.

As to the auxiliary forces employed, we are making it a practice to inject parallel to the actinotherapy cancer extracts into the patients. Occasionally we observed local reactions which may have led to sensitizing of the tumors, but we are under the impression that since we have employed these extracts we did not any more provoke any dissemination of mestastases.

While we prefer to place the Mesothorium into the non-opened bladder incidental indications may arise that call for cystotomy, as such I will quote the necessity of speedily relieving the patients' suffering, retention, hemorrhage and urosepsis. In dealing with the tumors after the bladder is once opened we consider the coagulation of the tumor by diathermy, a very valuable adjuvant. By this method the hemorrhages are stopped, infectious matter is destroyed and the tumor is reduced to a leathery crisp. In this way the deeper layers become more accessible to the rays.

We want it distinctly understood that we do not claim to eradicate a tumor by this procedure but we consider it only a preparatory step, although one of great value.

CHRONIC EDEMA OF THE VESICAL NECK.*

By Henry J. Scherck, M. D., F. A. C. S.

That an edema of more or less extent of the vesical neck is often superimposed on an enlargement of the prostate I feel certain is often the case, as I shall further emphasize a little later, but the occurrence in three cases of an edema of a chronic type sufficient in extent to produce all the symptoms both objective and subjective that are met with in cases of simple hypertrophy of the prostate gland is my postulate and offers sufficient excuse for the presentation of this report. A synopsis of the history of the first case follows:

The patient, Edward Burke, aged 70, was assigned to my service on February 15, 1915, and from the history written at that time and subsequent to the operation, the following notes have been made which seem essential for the consideration of the case.

The patient's complaints on admission were: First, swelling of the feet for the past month or so; second, difficulty in urination for past year, has had to be catheterized occasionally; third, attacks of inflammatory rheumatism; fourth, hemorrhoids.

Physical Examination.—A poorly nourished man who seems to be in no particular distress. Systolic murmur heard at aortic area, second aortic accentuated. Abdomen normal, with exception of an inguinal hernia of the right side; extremities slightly edematous. All else negative with exception of the bladder condition. On being transferred to my service I copy the following notes made by my interne. "Patient transferred to the urological service of Dr. Scherck on account of urinary disturbance, his chief complaint is that he is unable to voluntarily void his urine, and catheterization has to be resorted to"—gives the history of having had to urinate frequently for about a year—most noticeably at night. States the trouble has existed for at least two years. The history is again gone into very carefully in regard to all details but which have no particular bearing on the subject under discussion, hence, omit same. The diagnosis at this time, according to the history which was written before my examination of the patient was, as follows: 1st. Hypertrophied prostate; 2, Mitral regurgitation; 3, Aortic stenosis; 4, Bronchitis.

Examination by me of the local condition showed the prostate prominent by rectal examination; tumor about the size of a lemon, *extremely hard*, cystoscopic examination reveals a bottle-neck projection into the bladder, no calculi. Diagnosis, hypertrophy of the prostate, prostatectomy indicated pro-

*Read before the American Urological Association, North Central Section, Chicago, November 12th, 1915.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, February, 1916.]

vided general condition of patient can be improved. After about a month of preparation during which time compensation was established and general condition much improved, kidneys showing a satisfactory phenotallin output he was operated on as mentioned in the beginning of this account on March 19, 1915, in the presence of quite a gathering of local members of the profession. A suprapubic incision was made in the bladder, the operator introducing his finger directly therein, remarked "the tumor is disappearing under my fingers." Dr. Klippel, my assistant, was told to introduce his fingers immediately, and substantiated the fact that the tumor was gradually disappearing. In not more than ten minutes there was no projection of the tumor into the bladder, and the finger of the operator could be introduced well into the prostatic urethra. The prostate gland was not interfered with, as there seemed to be no further indication. The wound was closed, bladder drained, patient returned to the ward. He made an uninterrupted recovery, and in four weeks the suprapubic wound had healed. By this time urinary function had returned and was practically normal.

He was discharged from the hospital, and nothing was heard of him for about three months, when he again returned presenting all the symptoms that he had complained about on his first admission. He was again cystoscoped and again an intravesical projection could be easily seen. By rectal examination a hard mass could again be felt in the position of the prostate; this mass was particularly hard and unyielding, decidedly more so than is ordinarily felt in cases of simple hypertrophy. Catheterization was again resorted to as he was unable to voluntarily void his urine. Such is a brief history of this particular case. Since this case was first seen, I have had occasion in the course of my prostatic work (and having this case in mind) to notice that in two others on operating for hypertrophy of the prostate that after the bladder had been opened and waiting for a short time that the tumor mass decidedly diminished. In both of these cases, however, the prostates were sufficiently enlarged to warrant their being shelled out, but they served to show beyond question, that an edema of the vesicle neck, either associated or unassociated with hypertrophy of the prostate can cause obstruction. Surely many of us have been surprised how small removed glands sometimes are, contrary to our expectations. I have endeavored in a number of cases by means of an instrument devised by me (The Prostatometer *vide J. A. M. A.*, July, 1914) to approach at an estimation of the relative diameter of the prostate between the bladder and the rectum as compared with the diameter of the prostate after removal and find it is frequently 3 or 4 times as great before as I do upon examination of the specimen after removal. Of course, much of this discrepancy can be accounted

for by the tissues overlying and underlying the gland itself, but I am confident that there must exist in many cases an edematous condition.

It occurs to me that on account of the compression exercised by the fibrous covering of the gland as the prostate enlarges either as a result of inflammatory conditions, ordinary hypertrophy, arterial sclerosis, that an edema even unassociated with a typical adenomatous hypertrophy can occur. The explanation for the subsidence of the edema in the cases which I have mentioned can be explained as a direct result of the depletion due to the incision into the bladder. With this thought in mind, the good result in some of the cases which follows the punch operation, as suggested originally by Mercier and later by Young, can be accounted for by the relief of a chronic edema. In properly selected cases, those which are variously diagnosed as fibrous constriction at the neck of the bladder, so-called middle lobe enlargement of moderate degree, may possibly be associated with an edema and thus relieved by an operation which among its results unquestionably is a depletion without removal of the gland. I have hurriedly scanned the literature and find very little reference to this condition in the ordinary text-books, or in the current medical literature. However, John B. Deaver, in his work on enlargement on the prostate, its diagnosis and treatment, on page 77, edition of 1905, says: "Very great impairment of the urinary function may result when there is no apparent mechanical obstruction. In such cases the cause of the trouble is existence of a hard edema (I had noticed the extreme hardness of the gland in the case reported), such processes, the result of long preceding congestions or chronic inflammations, render the normally soft and pliable vesical outlet firm and rigid, so that the prostatic urethra can no longer open up into practical continuity with the bladder during urination, as a consequence obstruction arises from the immobility of the parts. In such cases the prostate itself may be little or not at all enlarged."

In speaking of this case, to Dr. Kolischer at the time, I am under the impression that he had on a former occasion called attention to this condition. This case was of particular interest to me, and is reported for what it is worth. I should like to hear from Dr. Kolischer, who may be able to give us some further observations on the subject.

A VERY UNUSUAL CASE HISTORY PRESENTING AMONG OTHER FEATURES A CYSTOSCOPIC BURN.*

By F. R. Charlton, M. D., Indianapolis, Ind.

Dr. Simon J. Young called me in November, 1912, in a case supposedly renal in character. The man, twenty-eight years of age, had ten years before suffered from right renal colic. The X-ray was said to have shown a stone and nephrotomy was done. Suppuration ensued and nephrectomy followed. The patient recovered and remained practically well until 1912. Left lumbo-abdominal pains then developed and increased steadily in severity. The patient thought he had passed two small stones by the urethra. The attacks of pain became so severe that morphine failed to relieve and mild chloroform anesthesia was maintained from thirty to sixty minutes before relief was obtained. These measures were resorted to on repeated occasions. The pain began in the left lumbar region and radiated downward and forward toward the pubes. There was no rise in temperature. Often a suppression of urine would accompany and persist for twelve hours. The patient was otherwise in splendid physical condition and to quote his wife, "ate enormously." The bowels were regular. Physical examination and urinary studies revealed nothing. Radiographs of the kidney were negative with and without resort to pyelography. X-ray studies of the intestinal tract made by Dr. Cole brought what we believe to have been the solution to our dilemma. A glance at the radiograph will show you an enormous sigmoid, which if uncoiled, would approximate three feet in length and reaches a position well to the right side of the abdomen considerably above the umbilicus. It descends toward the left lower quadrant where it terminates in a kink at its junction with the colon. A second constriction is apparent near its terminal portion. This is probably due to an adhesion.

The diagnosis was colonic stasis contributed to by an almost unbelievable gluttony.

The patient was placed on a greatly restricted diet and hygienic measures. Since this plan was adopted he has had no pain save slight attacks that invariably followed his breaking away from his diet and overeating. Good behavior entirely controlled the situation. The above is from notes by Dr. Young.

While doing ureteral catheterization a short circuit was established with evidently a true cataphoresis. There resulted a burn of the second degree nearly an inch in diameter immediately surround-

*Read before the American Urological Association, North Central Section, Chicago, November 12th, 1915.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, February, 1916.]

Fig. 1.

Enormous distention of sigmoid.

ing the meatus. The patient complained of a smarting sensation but not emphatically enough for us to realize what we were doing. The appearance was of a greenish-black eschar such as might occur in a third degree burn. This, however, was superficial and we felt warranted in assuming that the discoloration was due to a copper cataphoresis induced at the shoulder of the cystoscope. Healing took place without a scar and we congratulated ourselves on such a termination in the only accident of its kind that we have seen.

I ask just a moment further to show the roent-

Fig. 2.

Roentgenogram of a kidney in which pyelography was followed by death.

genogram of a kidney where death followed pyelography. The case was reported at Philadelphia and Atlantic City in 1914, but the plate was not shown. The individual had a tumor mass the size of a small grape fruit. I made no examination, simply being called by Dr. E. D. Clark, the surgeon in charge, to do pyelography. Fifteen c.c. of a twenty-five per cent. solution of collargol was used with a hand syringe, the idea then prevailing and still being adhered to by some eminent men, that a catheter would not so block the ureter but that excess of fluid would find its way back along the course of the ureter. Such an assumption proves

not to be a safe one, as is evidenced by this case. There was some distress toward the close of the injection but it was not so extreme as to cause us to suspend our efforts toward securing a good plate. This we were able to do. The patient quickly went into a state of shock and died eight hours later. Hemorrhage may have followed the rupturing of some diseased vessel but even if so, it would hardly be a vessel of such size as to produce the almost instantaneous shock that supervened here. Necropsy was not secured. Granting that I had produced some small rupture in the pelvis, I could hardly see why death should have followed so promptly unless from extensive hemorrhage. The patient had an irregular heart action and an almost cyanotic color prior to this so that we at the time looked upon the death as probably due to a bad myocardium that failed to rally after the considerable shock that we produced.

Dr. Eisendrath's work on pulmonary embolus may contribute toward the explanation of this death.

THE BLADDER IN EARLY TABES—REPORT OF CASE.*

By Wm. S. Ehrich, M. D., F. A. C. S.

While we are all familiar with the vesical conditions accompanying tabes dorsalis in the later stages, it seems from the scarcity of literature that the early diagnosis of the disease by means of cystoscopic findings is of sufficient rarity to make the following case of interest.

The only cases that I had been able to find up to the time when this diagnosis was made were two that were reported by Dr. Irvin S. Koll who assures me that he, too, had searched literature without finding any reference to this condition.

In both of Dr. Koll's cases, however, there were other symptoms recorded. In case No. 1, pain is described as being in the lumbar region radiating around the abdomen and down to the bladder. Case No. 2, pain which was typical of renal colic. In the case to be described there was no other symptoms except those found in the bladder.

Case No. 1. O. H. C. Age 50 years; traveling salesman, married, weight 185 pounds, height 6 feet, well nourished.

Complaint.—Inability to void urine without considerable effort and time.

Previous History.—Infected with lues 23 years ago and with gonorrhea a few years later. Since the latter infection he has always had more or less trouble with his urine but it has become much worse in the last six months. Nothing else of interest in his former life.

Present History.—The patient complains of an inability to completely empty the bladder without much straining and taking from five to fifteen minutes to void. The frequency during the day is practically normal but he arises twice to three times during the night and must massage the abdomen before the stream of urine starts. When once started the stream is of fair size and is ejected, not falling perpendicularly from the penis.

Physical examination:

Meatus.—Normal, no discharge.

Urethra.—Normal, dilated with Kollman instrument to 40 without any pain nor blood. There was little resistance.

Prostate.—Very slightly larger than normal, not sensitive, no pus in secretion.

Vesicles.—Normal.

Testicles.—Normal, no sensitive spots.

Bladder.—Cystoscope passed without any pain or even inconvenience and there was no anesthetic used. The cystoscopic field was rather striking. The bladder walls showed little if any deepening

*Read before the American Urological Association, North Central Section, Chicago, November 12th, 1915.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, February, 1916.]

of color, the fundus was normal, laterally there were fine trabeculations, the prostate was not elevated but the interureteric ridge was prominent, the ureteral orifices seemed to lack the normal elasticity. Fully dilating the bladder made no change.

Urine.—Residual varied but at times reached 6 ounces. Chemical and microscopical examination normal.

Blood.—Wassermann reaction negative, could not obtain spinal fluid.

Reflexes normal, pupils slightly sluggish but not A-R.

No disturbance of coordination.

No Rhomberg.

The diagnosis was based upon (1) lack of painful sensation during instrumentation; (2) inability to start stream which was of fair size when started; (3) history of lues; (4) cystoscopic findings.

A NEW FORM OF OPERATIVE URETHROSCOPE.*

By Ernest G. Mark, M. D., F. A. C. S., Kansas City, Missouri.

In the *Journal of the American Medical Association* for December 19, 1903, we described our first type of air-inflation operative urethroscope which was later presented at the 1904 meeting of the American Urological Association. This instrument was the outcome of studies of the work of Kollmann, who first suggested the possibilities of operative work through the urethroscope and of the work of Antal, of Buda Pesth, of Hurry Fenwick, of London, and of Frank Hewell, of New York, who were the pioneers in applying the air-inflation principle to urethroscopy. While we have been keenly aware of the advantages of water distention in urethroscopy for diagnostic purposes, we have not been fully convinced of any superiority over air-inflation for such purpose and we have become more and more firmly convinced of the overwhelming value of air-inflatation in intraurethral operative procedures. And this despite our report of a case of air-embolus in the *Journal of the American Medical Association* for February 11, 1911, occurring under air-inflation operative urethroscopy. We have since seen similar phenomena occur fairly frequently but attach no importance to them.

The instrument presented by us in 1903 and 1904 had naturally many shortcomings, but these we have endeavored to rectify in the instrument presented here which has been made for us by Wappler.

The accompanying photograph sufficiently suggests the use of the various operative equipments. In the short time that we have made use of this instrument we have found it to be far more satisfactory than any other with which we are acquainted. We would especially call attention to the blade of the knife, marked Fig. 2, No. 5, for stricture work, which we believe more nearly accords with the type of knife used in urethrotomes than anything which we have seen. We have often insisted upon the use of the urethroscope in both diagnosis and operative treatment of certain varieties of stricture. In using this knife, the knife is advanced beyond the presenting stricture, placed against the mucosa and the instrument withdrawn sharply, care being taken that the air inflation is stopped before the incision is made. We would like to call attention to the catheter-carrying tube, which while of use for catheterizing the ureter of the female is of very distinct advantage in high frequency destruction of

*Read before the American Urological Association, North Central Section, Chicago, November 12th, 1915.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, February, 1916.]

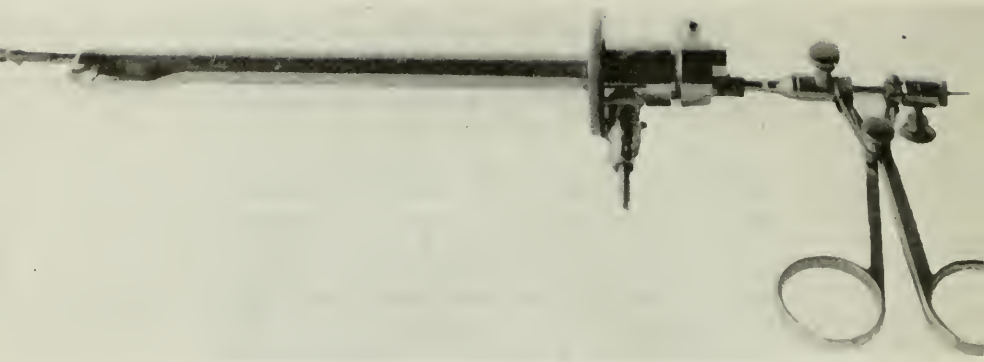


Fig. 1.

Instrument assembled with grasping forceps working through tube.

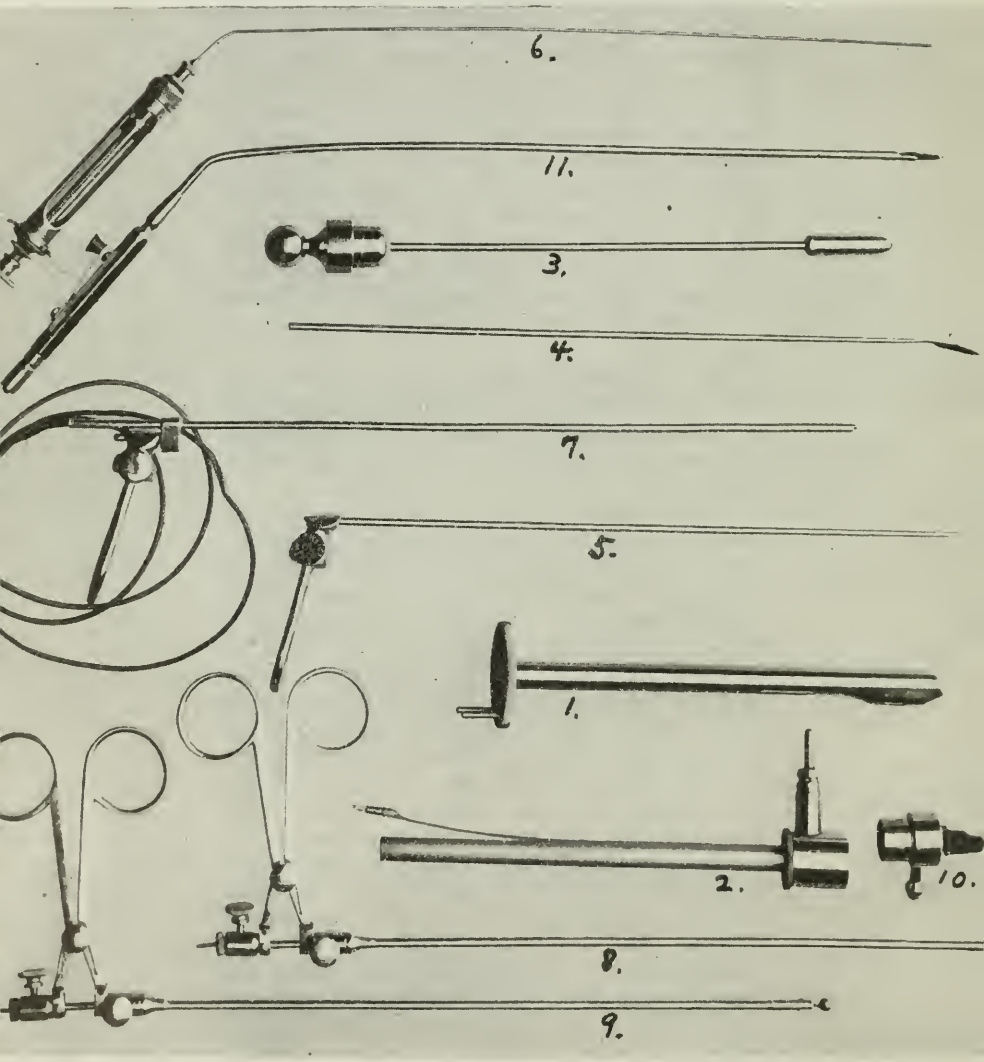


Fig. 2.

1, Endoscopic tube; 2, light carrier and inside tube; 3, obturator; 4, knife; 5, stricture knife with universal handle attached; 6, gold cannula with syringe; 7, cannula for carrying fulguration wire or catheter; 8, grasping forceps; 9, biting forceps; 10, window; 11, galvano-cautery.

the verumontanum or of small papillomata in the deep urethra, or for the destruction of the small bullae, which sometimes present at the vesical neck.

For work in the deep urethra the instrument is turned upside down in order that its light may be thrown more distinctly upon the floor where most of the pathological conditions occur. The corrugated forceps are for the purpose of removing foreign bodies from the urethra and bladder. The biting forceps are of use in removing bits of tissue, polypoid growths, etc.

The sharp pointed curved knife is useful in splitting up cystic follicles. The long gold cannula is used to most excellent advantage in injecting enlarged diseased follicles. We no longer use it for the purpose of catheterizing and injecting the ejaculatory ducts since the operation of Belfield and Herbst has been devised. The small electrolytic needle is of more advantage in the destruction of enlarged diseased crypts, or may be used to advantage in the treatment of urethral varix.

The instrument as a whole gives the best operative field of any urethroscope which we have seen.

In 1904, on the presentation of the instrument before the American Urological Association, there was a tendency on the part of the profession to criticize or ignore the value of air-inflation in operative urethroscopy. It is indeed gratifying to the author to note that a great many of the urethroscopes now in use for both diagnostic and operative purposes, have adopted the air-inflation principle. We have found it necessary to use but one length of tube and calibre for this work and we agree thoroughly with Young that a meatus which does not permit of the introduction of number 26 F. instrument is too small for accurate or satisfactory work in the urethra. In all such cases we have not hesitated to do a meatomy.

626 Lathrop Bldg.

ANATOMY AND PATHOLOGY OF THE SEMINAL VESICLES.*

By E. O. Smith, M. D., Cincinnati, Ohio,

Professor Genito-Urinary Surgery, Medical Department, University of Cincinnati.

The seminal vesicles were first described by Fallopius, 1562, and may therefore be designated as the male Fallopian tubes. Further analogy between the Fallopian tubes of the female and the seminal vesicles of the male rests on the fact that both are not only frequently involved in inflammatory conditions, but both are often the seat of gonorrheal infection.

Allow me to state here that the basis of this discussion was a prolonged study of many postmortem specimens of the seminal vesicles, prostates and urinary bladders obtained from the Pathological Institute of the Cincinnati General Hospital.

The seminal vesicles are located between the urinary bladder and the rectum, above or posterior to the prostate gland, and external to the vasa deferentia. The duct from the vas joins a similar tube from the vesicle forming the ejaculatory duct, which with a corresponding structure from the opposite side passes between the posterior and lateral prostatic lobes terminating near the anterior portion of the verumontanum or within the sinus pocularis.

The lower portion of the vesicle rests upon the posterior border of, and is with difficulty separated from the prostate. This is particularly true if there has been chronic inflammation of these parts. The general direction of the long axis of the vesicle is upward and outward from the posterior border of the prostate for a distance varying from 6 centimeters to 22 centimeters. The angle of divergence varies in different individuals, and may vary greatly in the same individual, this depending upon a collapsed or dilated condition of the urinary bladder. The greater the bladder distension, the farther are the upper poles from the mid-line.

This is an *important fact* to bear in mind when massaging or stripping the vesicles. In many cases where there has been a prolonged obstruction to the outflow of urine from the bladder, the long axis of the vesicles is at almost right angles to the vertical or mid-line of the body.

Except in very short vesicles the upper pole extends to and in most specimens overlap the ureter where it enters the outer surface of the bladder. The vesicles, except the lowest portion, are external to that part of the outer wall of the bladder which corresponds to the trigone, and are held in

*Read before the American Urological Association, North Central Section, Chicago, November 12th, 1915.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, February, 1916.]

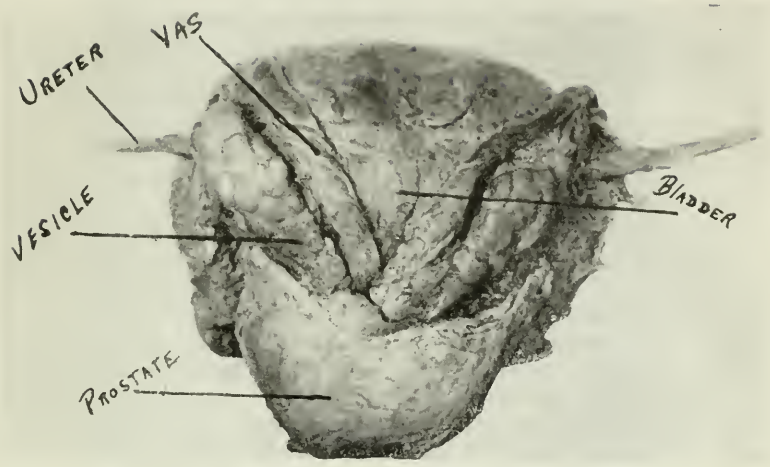


Fig. 1.

Showing relations of vesicles to prostate, vasa deferentiæ, bladder and ureters.

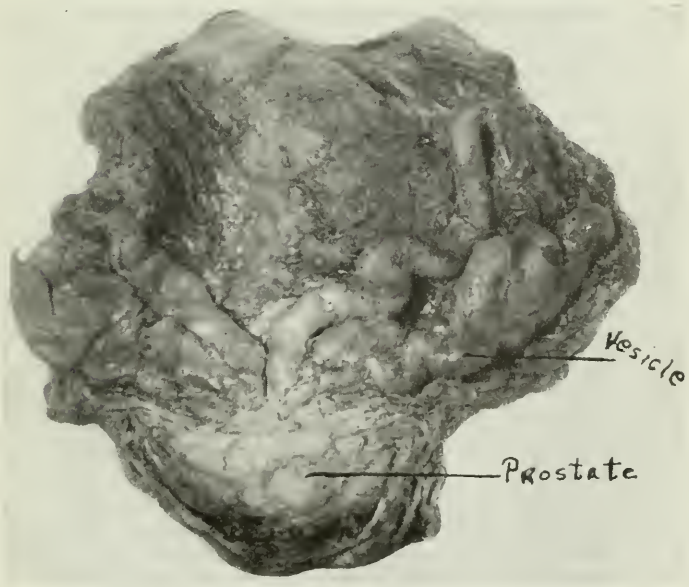


Fig. 2.

Long axis of vesicles forms nearly right angles with long axis of body. Upper, outer half of right vesicle contains pus.

contact with this portion of the bladder. This accounts for the vesical and urinary symptoms that so often accompany vesiculitis and perivesiculitis. It might be added that the aforementioned symptoms have frequently been treated empirically without regard to cause.

The close relation of the upper portion of the vesicle to the ureter explains many cases of *narrowed ureters* due to impingement on the ureter of a pathological vesicle and its consequent thickening, plus the perivesicular inflammatory tissue. All who do cystoscopic work have had the experience of being unable to introduce the ureteral catheter more than ¾ of an inch to 1 inch, yet there was urine flowing from the ureter. There can be no doubt but that this failure is often due to a narrowing of the lumen of the ureter and a fixation of it by these external adhesions from the vesicle. As a result of the fixation there is an angulation which the ureteral catheter can not readily pass. It is a well established fact that a normal kidney may take bacteria from the blood stream and deposit them in the urine stream without damage to the kidney itself. It has further been demonstrated that even partial obstruction of the ureter will sufficiently lessen the normal activity and resistance of the kidney so that it becomes easy prey to bacteria in the blood stream.

Following these facts a little further it requires no great strain on the imagination to see how chronic vesiculitis and perivesiculitis can be a predisposing factor in the development of infections of the kidney.

Continuing from the posterior border of the prostate is a *fascial membrane* which extends beyond the vesicles. This can easily be separated from the normal vesicle, but with much difficulty where there has been perivesiculitis.

Barnett called attention to the importance of getting beneath this fascia when attempting to expose the vesicles, either for drainage or removal. This line of cleavage once found, the rectum is safe from puncture. Beneath this fascia is found a much thinner fascial layer which envelops the vesicle and ampulla of the vas deferens. Beneath this are other bands of fascia that hold in place the various loops and saccules of the vesicle. The normal vesicle is easily detached from all its surroundings except at the upper pole, where the blood vessels enter and at the lowest part which is in contact with the prostate. In doing a vesiculectomy the vessels at the upper pole should be ligated *before* removal of the vesicle to prevent troublesome or possible fatal hemorrhage. The loss of blood from a vesiculotomy or simple drainage operation is negligible.

In about one of every ten specimens examined, the *peritoneum* extended well down on the vesicles and occasionally to the posterior border of the prostate. In such cases, one would be dangerously

near the peritoneal cavity when operating on the vesicles.

One specimen disclosed no distinct vesicles, but mere rudiments about one-half inch in length.

Picker in a paper before the 14th International Medical Congress held in London, 1913, grouped the vesicles according to their anatomical arrangement in 5 classes. (1) The simple straight tubes; (2) thick twisted tubes with or without diverticula; (3) thin straight or twisted tubes with or without diverticula; (4) straight or twisted main tube with large grape-like diverticula; (5) short main tube with large irregular ramified branches. This seems to be an unnecessary multiplication of classes as the large majority of the specimens I examined were of the continuous tubular type, not twisted but folded at sharp angles upon themselves many times. Most of the other varieties were simple modifications of this type. There were a few pear-shaped vesicles, whose interior had the appearance of multiple saccules communicating with a common channel, or vestibule, but not a distinct tube or tubule.

The most *important anatomical feature* of the vesicle from a clinical or pathological viewpoint is the multiple sharp angulations of the tubule in a vast majority of the specimens. There can be no emptying of the vesicles except by some sort of a peristaltic wave which must begin at the blind extremity and travel along the tube towards its outlet into the ejaculatory duct. I am inclined to believe that much of the benefit that patients derive from a properly executed massage of the vesicles is due to a stimulation of this normal peristaltic wave. Very much on the same principle as the old time massage and kneading of the abdomen to encourage intestinal peristalsis, before the days of Lane's kink, Jackson's membrane and Russian oil. "A properly executed massage," therefore, is a treatment that is not too severe and does not produce trauma.

The appearance of the interior of a normal vesicle is that of fine trabeculations, suggesting irregularly arranged spider webs or tendrils. When this condition does not present and the tubules or saccules are smooth inside, there has been suppuration with destruction of the mucous lining.

The *vesicle wall* is constructed of three layers of tissue. The outer is a fibrous layer, beneath this is a middle layer of muscular tissue, which produces the peristaltic movements that empty the vesicle. The interior is covered with a mucous membrane which probably has some secretory function, not fully and satisfactorily explained. The arrangement of the tubules gives *a very extensive mucous surface with the worst natural drainage.* This, partially at least, accounts for the fact that about 50 per cent. of the post-mortem specimens examined were, in some way pathological. The farther up the tubule, near the blind end, the more difficult is the drainage, hence, we would expect

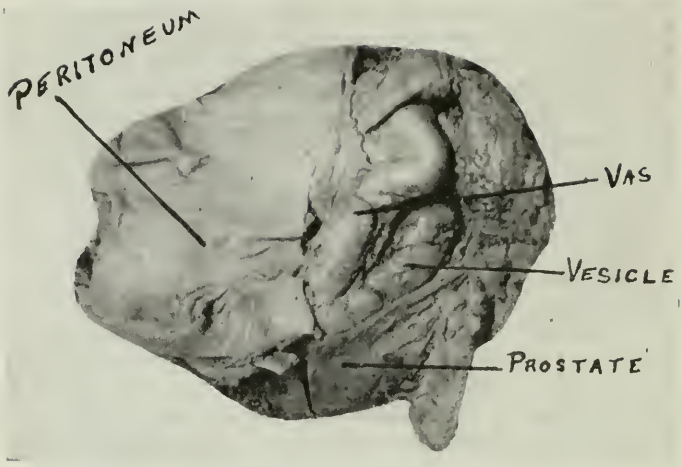


Fig 3.

Peritoneum extends to prostate covering vesicles and vasa. Has been removed from right side.

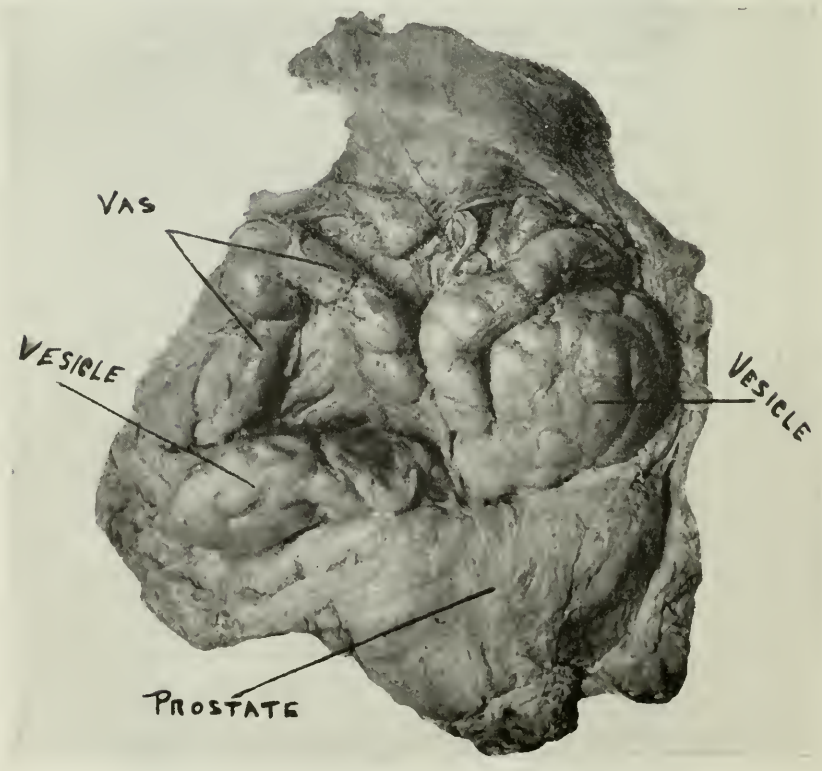


Fig. 4.

Vesicles seat of suppuration. Left vesicle turned down showing tortuous and angulated vas.

to find most of the pathological conditions in the upper portion of the vesicles, where they were.

Our findings in these specimens demonstrate that a simple single incision, especially in the lower part of a vesicle containing pus, *will* not, *can* not, establish satisfactory surgical drainage. To drain propperly, multiple incisions are required, particularly high up on the vesicle. Judging from the specimens alone one would be led to the conclusion that nothing short of a vesiculectomy could be effective, yet we know from practical experience that thorough vesiculotomy is followed by the most satisfactory results in properly selected cases.

While these structures were discovered by Fallopius in the 16th century, and recognized as the seat of inflammation by Morgagni in the 18th century (1745), it remained for Fuller and Belfield, about the beginning of the 20th century, to bring to our attention the importance of these hollow organs as the hiding place for numerous bacteria—principally Neisser's diplococcus, and its associates, the staphylococcus, the streptococcus and the colon bacillus. It was they who demonstrated the relation between chronic seminal vesiculitis, chronic recurrent urethral discharge, and certain cases of arthritis. Invasion of the vesicles by bacteria from the posterior urethra is certainly a simple matter, there being required only a short trip through the ejaculatory duct, a distance of little more than one inch. Theoretically, at least, one would suppose from the very nearness of the vesicles to the posterior urethra, as compared to the epididymis, that the vesicles would be more frequently involved in secondary infection than is the epididymis. Who can say they are not? It may be that the frequency of vesicular infections varies in direct proportion to the degree of diligence in examining these structures.

Lewin and Baum examined 1,000 cases of gonorrhea, and found the posterior urethra involved in 65 per cent., and the seminal vesicles in 35 per cent. While there are no statistics at hand to prove the assumption, it seems reasonable that the vesicles could easily be infected from every case of chronic posterior urethritis, and in many cases of acute posterior urethritis. If any surprise is to be expressed, it is that they escape in any case of posterior urethritis.

When looking about for "*focal infections*," the vesicles must not be overlooked. Before having a few hundred dollars worth of bridgework removed from a patient's mouth for arthritis, it would do no harm to investigate the vesicles. The fact that the patient states that he has never had gonorrhea should not deter one from examining the vesicles. He may be mistaken or may have forgotten, besides a previous gonorrheal infection is not absolutely necessary.

Vesiculitis may present in men who live under a high nervous tension, who indulge in sexual ex-

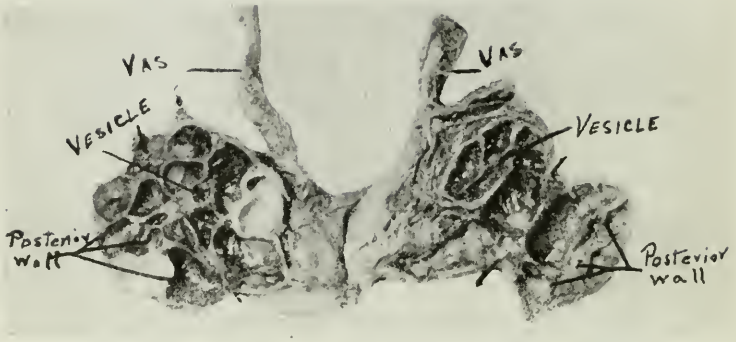


Fig. 5.

Vesicles filled with pus, divided in half, posterior walls turned out exposing saccules.

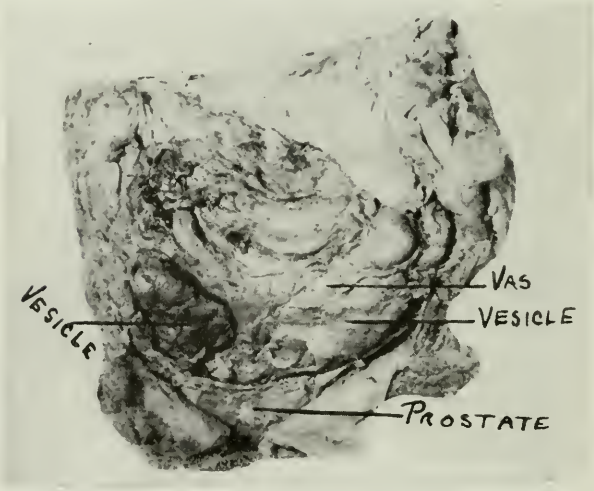


Fig. 6.

Dense tissue about vesicles, vasa and prostate, result of chronic inflammation. Left vesicle has been dissected from its bed of adhesions.

cesses both normal and abnormal, and who are intemperate in the use of tobacco and alcohol. Horseback riding, bicycle and motorcycle riding are contributing factors toward the development of vesicle trouble.

Dr. Robert T. Morris has given out for careful consideration and investigation the suggestion that possibly there is some relation between "focal infection" and malignancy, even though the malignancy be in some part of the body far removed from the focus of infection. While, at first thought, this may seem far-fetched, yet it is a study in biochemistry, which has much more to commend it than the suggestion a few years ago that goitre and mammary malignancy were produced by intestinal stasis.

Tuberculosis of the vesicles is practically always secondary to tuberculosis elsewhere in the genital tract. Contrary to much of the information we formerly had, it was found that vesicles which felt nodular when examined digitally per rectum are not necessarily the seat of tuberculosis. What was diagnosed as tuberculous nodules from palpation in some specimens proved to be thickened and sclerosed areas at the sharp angles of the tubules. In one specimen a small single nodule, about the size of a navy bean was felt in the right seminal vesicle. When this was dissected out it was a very firm and completely capsulated cyst which contained a clear gelatinous material.

The only cases of *malignancy* found were secondary to malignancy in the wall of the urinary bladder. There is no logical reason why the vesicles should not be involved in primary malignancy, and no doubt they are, yet none were found among the specimens forming the basis of this study.

No *calculi* were found in the vesicles among our specimens. They certainly are not very common. Dr. Eugene Fuller informed me in a personal communication that in the more than seven hundred vesiculotomies that he has performed he found calculi in only seven cases, and but once in both vesicles of the same patient.

There is a case reported by James and Shuman where a seminal vesicle calculus gave rise to the same symptoms as those typical of renal colic, and it was not discovered until after a futile surgical search was made for a stone in the ureter. This is an exceptional case, and an error that any one might have made. However, with such a case report before us, we should profit by their experience, and ever keep this possibility in mind when studying "renal colic."

The points in the study of the anatomy and pathology of the seminal vesicles that seem worthy of special mention are:

(1) The wide variations in size and positions of the vesicles;

(2) Frequency of vesiculitis, both suppurative and inflammatory (focal infections)

(3) The close relation of the vesicles to the ureters and in some cases to the peritoneum;

(4) The futility of severe massage treatments;

(5) The importance of multiple incisions particularly in the distal portions, when surgical drainage is being done; and

(6) Palpable vesicle nodules are not always tuberculous.

BIBLIOGRAPHY.

Barnett, C. E.: Pathology of the Seminal Vesicles and Prostate, with Suggestions of the Necessity for Surgical Treatment. (*J. Indiana M. Assn.*, 1909, V. 2, pp. 320-22.)

Barney, J. D.: Observations on the Seminal Vesicles. (*Tr. Am. Ass. Genito-Urin. Surg.*, 1914, V. 9, pp. 72-91.)

Barney, J. D.: Recent Studies in the Pathology of Seminal Vesicles. (*Bost. M. and S. J.*, 1914, V. 171, pp. 59-62.)

Belfield, W. T.: Pus Tubes in the Male, Surgical and Vaccine Treatment. (*Jour. A. M. A.*, 1909, Vol. 53, pp. 2141-43.)

Ceelen, W.: Ein Fibromyom der Samenblase. (*Virchow's Arch. f. path. Anat.*, 1912, V. 207, pp. 200-206.)

Felix, W.: Zur Anatomie des Ductus Ejaculatorius, der Ampulla Ductus Deferentis und der Vasicula seminalis des Erwachsenen Mannes. (*Anat.*, Hefte. 1901, V. 17, pp. 1-50.)

Fuller, Eugene: Seminal Vesiculotomy. (*Jour. A. M. A.*, Vol. 59, pp. 1959-62.)

Hyman, A. and Saunders, A. S.: Chronic Seminal Vesiculitis; A Clinical Résumé with Special Reference to the Urethroscopic Findings in the Posterior Urethra. (*N. Y. M. J.*, 1913, V. 97, pp. 652-54.)

James and Shuman: Seminal Vesical Calculus Simulating Nephrolithiasis. (*Surg., Gyn. and Obstet.*, XVI, 1913.)

Junkerman, C. F.: Hematuria and the Pathology of Chronic Seminal Vesiculitis and Ampullitis Under Which Latter Disorder We Get Bloody Semen. (*Med. Century*, 1911, V. 18, pp. 113-15.)

Lewin, A. and Bohm, G.: Zur Pathologie der Spermatocystitis Gonorrhoica. (*Ztschr. f. Urol.*, 1909, V. 3, pp. 43-64.)

Nussbaum, M.: Ueber den Bau und die Tatigkeit der Drüsen. VI. Der Bau und die Cyclischen Veranderungen der Samenblasen von Ranafusca. (*Arch. f. mikr. Anat.*, 1912, V. 80, 2 Abt., pp. 1-59.)

Oberndorfer, S.: Beiträge zur Anatomie und Pathologie der Samenblasen. (*Beitr. z. path. Anat. u. z. allg. Path.*, 1902, V. 31, pp. 325-46.)

Petersen, O. V. C. E.: Beiträge zur Mikroskopischen Anatomie der Vesicula seminalis des Menschen und Einiger Säugetiere. (*Anat.*, Hefte. 1907, V. 34, pp. 237-62.)

Quinby, W. C.: The Anatomy and Physiology of the Seminal Vesicles with Regard to the Treatment of Their Lesions. (*Boston. M. and S. J.*, 1914, V. 170, p. 58. Discussion, pp. 68-71.)

Thomas, B. A. and Pancoast, H. K.: Observations on the Pathology, Diagnosis and Treatment of Seminal Vesiculitis. (*Ann. Surg.*, 1914, V. 60, pp. 313-18.)

Voelcker (Heidelberg): Die Samenblasen. 1912.

Weisz, F.: Zur Aetiologie und Pathologie der Samenblasenerkrankungem. (*Wien. med. Presse.*, 1904, V. 45, p. 1581.)

OPERATIONS BY LOCAL ANESTHESIA ON THE EXTERNAL GENITALIA AND PROSTATE.*

By A. C. Stokes, M. D.

About ten years ago we began doing operations by local infiltration anesthesia. This paper is meant to cover some of our practical impressions gleaned from experience in the above operations.

First. To do these operations successfully without pain to the patient, the operator must have thorough command of himself and be in a position to meet every emergency of the operation without irritation or disturbance of the equilibrium of the operating room. The progress of the operation must be without a break in technique.

Second: The cutting instruments used must be very sharp. Little or no pain is produced by cutting but patients cannot tolerate pulling or dragging on the tissues. Artery clamps must not be pulled, retractors must be handled with the utmost care and dissections must not be made until we are certain that the field of dissection is thoroughly infiltrated, and then with cutting instruments only.

Third: One must assure the patient that any time that he feels pain or is hurt that you will stop at his request. A tactful nurse or house officer must sit at the head of the patient and engage him in conversation as much as possible during the entire time of the operation. The patient must be assured that he will not be harmed and that no pain will supervene. The eyes should be covered because to some people the sight of blood produces a bad temporary reaction. Our records show that we have done during the last ten years the following operations by local anesthesia: Inguinal hernia, 34 cases; hydrocele, 19 cases; varicocele, 32 cases; prostatectomy, 3 cases; amputation of the penis and removal of the inguinal glands, 1 case; hemorrhoids, 5 cases; suprapubic cystotomy, for different reasons, 12 times.

It is not my purpose to discuss the question of general analgesia by infiltrating large trunks of plexes of nerves or by introducing anesthetic substances into the spinal cord. Our experiences together with those of the reports, have shown that these methods are not only impractical but contain elements of danger to which we do not care to subject our patients. We are convinced that the only local anesthetic worth considering is an anesthetic which infiltrates or blocks the nerves in the immediate area of operation. Infiltration of the sacral plexus or brachial plexus or any other

*Read before the American Urological Association, North Central Section, Chicago, November 12th, 1915.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, February, 1916.]

nerve trunks distant from the field of operation is not practical.

To infiltrate small nerves in the region of operations like those done on the external genitalia, it is necessary to infiltrate the area around the operative field, because the nerves are not quite definite in their course or in their distribution, and to say that the genital branch of the genito-crural supplies the region of the scrotum does not describe its course and we note further that the description of the course of these nerves varies in different anatomies and one must infiltrate the entire area where these nerves may possibly run. It becomes necessary to point out in each operation the necessary areas to infiltrate.

During these operations we have used various solutions starting with Schleich's solution, cocaine, morphine and cocaine, eucaine, quinine hydrochloride, alypin, stovaine and novocaine. We have discontinued the use of cocaine and its immediate derivatives and also morphine and stovaine, leaving only alypin, quinine hydrochloride and novocaine. These three drugs have possibilities in local infiltration. Novocaine is by far the most commonly used. In hernia cases six were done with cocaine, three with Schleich's solution, two with eucaine, leaving twenty-three that have been done with novocaine in some concentration or other. No hernia has been done with quinine infiltration.

In hydrocele all but four cases have been done under novocaine. Of these four, two were done with Schleich's solution and two with quinine. Of thirty-two variocele cases, three were done with cocaine, five with quinine and the remaining with novocaine.

Of the suprapubic cystotomies two were done with cocaine and the rest with novocaine. In hemorrhoids no drug except novocaine has been employed. In prostatectomies our aim has been to combine several anesthetics as will be brought out later in the paper.

The next point of interest is the reason why we have chosen one anesthetic or another. Alypin is quite toxic and in doses of larger quantities than a gram we are fearful of its results. It was used to anesthetize mucous membranes either as a solution dropped directly on the mucous membrane as a tablet in the posterior urethra or as a solution in the bladder or rectum. As an infiltrating agent to be used subcutaneously or intercutaneously it is not to be considered. Quinine is recommended by Hertzler as containing anesthetic properties. It is non-toxic and can be used in any quantities without any toxic results whatever. While Hertzler claims that quinine has the same therapeutic results as novocaine our results have seemed to prove that especially in regions where the skin is very thin, healing is not as prompt and sloughing occasionally takes place following its use. The anesthesia produced by

quinine lasts as long as that produced by novocaine. Novocaine has a toxic element that must always be remembered. It is not safe to inject over four or five grains of novocaine at one time for any operation although the recorded toxic dose is seven grains.

Despite opposition to local anesthesia it is slowly advancing in the field of surgery and the above operations, with the exception possibly of some cases of hernia and prostatectomy should always be done with local anesthesia rather than general. Morphine was used hypodermically, injecting a quarter of a grain an hour before each operation. A one hundredth of a grain of scopolamine was added. For a few operations morphine and scopolamine three-fourths of an hour before each operation was used. In a certain number of cases more or less vomiting was seen and two patients suffered respiratory troubles. In about ten per cent. of our cases temporary shock almost to the point of fainting during the operation was noted. In about six per cent. of our cases the patient vomited three or four times after the operation. Possibly the vomiting and the fainting and the sick feeling were due to morphine. It, therefore, became our desire to do these operations without the use of any general narcotic. Since that time have been done eighteen hernias, nineteen hydrocele operations, twenty-two operations for varicocele, and two prostatectomies without a hypodermic injection of any drug that produced a general narcosis. Since this change our patients have rarely vomited. Sick feelings, such as dizziness, have followed only three cases of hernia, three cases of hydrocele, no case of varicocele, and these were cases in which large quantities of novocaine were used.

In hernia the skin was infiltrated by the methods of wheals and the line of incision by introducing the solution intracutaneously. The internal solution is introduced by a small hypodermic needle after which the desired quantity of solution may be introduced subcutaneously and into the fascia of the external oblique. The incision is then made down to the cord, and now our chief trouble begins in anesthetizing the fascia of the cremasteric and peritoneum of the sack. These anatomical structures are supplied by the genital branch of the genito-crural and that it usually runs posterior to the cord. Our troubles are then to infiltrate the cord and sack so that we can separate one from the other. A circular infiltration of the external ring as far under the cord as possible will answer all purposes necessary. This infiltration should be made as soon as the cord is reached and then time for the anesthetic to take effect should be allowed, which time can be used by the operator in dissecting back the fascia of the external oblique branch. At the end of that time the cord will be anesthetized. By gentle dissection with a blunt instrument the cord and sack can be raised out of its bed. If now

there are any sensitive points the cords can be further infiltrated and the cord separated from its fascia after the sack is separated from its fascia. It is well to make a circular infiltration on the base of the sack before an attempt to tie off is made. The tie having been made and the sack cut off the operation for hernia is practically finished. No trouble has been experienced in closing the hernia wound.

Operations for varicocele are so simple that they should be done with local anesthesia. Infiltrating the skin and the top fascia and the fascia about the veins is a perfectly simple proposition, and raising up the veins and cutting and tying them or disposing of them in any way you see fit has never in our experience met with any danger or difficulty whatever.

Hydrocele is an operation that can be done under local anesthesia. Our hydrocele records show that 8 per cent. of them suffer from some pain in the dissection of the tunica from the cremasteric fascia. No attempt should be made to anesthetize the cremasteric fascia from the outside before the incision is made through the scrotum into the sack, and very careful infiltration must then be made around the entire circumference of the neck of the sack clear at the top of the hydrocele. After this infiltration is complete and thorough the removal of the tunica is made with absolutely no pain and can be done with a pair of sharp scissors as quickly as it can be done under general anesthesia.

Amputation of the penis offers no difficulties. The nerves all pass out on the dorsal side and can be infiltrated at the base and the entire organ removed with absolutely no pain. Removal of the glands of the groin, however, is better done with general anesthesia. Local is used when absolutely necessary and when general is contraindicated.

We have not removed a kidney but by proper para-vertebral infiltration this operation could be done easily. Ten cases have been collected from literature in which a kidney has been removed by local anesthesia.

The chief excuse for writing this paper at this time is the possibility of developing a technique by which we can do prostatectomies under local anesthesia. Three cases have arisen in which a general anesthetic was contraindicated. Following the reports of Allen, Legueu and others we have tried to develop a technique for the removal of the prostate suprapubically by means of local anesthesia and not by sacral anesthesia or the infiltration of large nerves but by infiltrating the area of operation as we proceed. Our technique at present has resolved itself into the following:

No morphine at all is given hypodermically or any other narcotic. One-half hour before the operation the rectum is washed out clean and two ounces of a five per cent. alypin solution are in-

troduced. The posterior urethra is anesthetized by depositing a tablet of alypin there. The bladder is filled with a one-quarter of one per cent. of solution of alypin. The suprapubic region is now infiltrated with novocaine and an incision is made down through the abdominal wall, into the space of Retzius as usual; the anterior surface of the bladder is again infiltrated with novocaine and the bladder is opened by a large incision extending down to the symphysis and almost to the prostate. By careful retraction the prostate may now be brought into view. The hardest problem now presents itself, anesthetizing the prostate. A ten per cent. solution of hydrochloride of quinine and urea. By the use of a long needle we aim to infiltrate the region between the true capsule of the prostate and the prostate proper with large quantities of quinine, knowing that quinine is a circulatory stimulant and will to a certain extent react against the alypin and novocaine. When this is done a small incision is made with a sharp knife through the mucous membrane to the prostate in the region of the posterior urethra and an attempt is made to shell out the prostate as usual. A finger is introduced into the rectum and the prostate is pushed up into the region of the bladder and we proceed to shell it out. This must oftentimes be done very slowly and gently. If the incision can be made around the prostate and there are no adhesion of the prostate to the capsule it will slip out without pain. Some pain has been experienced at this point. In our first case, a prostate done by this method, morphine was used and the patient promptly died in twenty-four hours. Braun in his most excellent work on this subject states that morphine is absolutely contra-indicated in all prostatectomies done under local anesthesia. He states very tersely, "It is paradoxical to attempt to drive out the devil by the use of Beelzebub." Our other two cases recovered uneventfully. So indefinite seems to be the knowledge of our nerve supply to the prostate that we are not quite clear that our procedure is entirely rational. The use of quinine in the infiltration of the prostate is a correct procedure. Whether we should endeavor to infiltrate the entire prostate or only between the capsule of the prostate is not clear.

We have had no experience with perineal prostatectomy under local anesthesia.

TRANSACTIONS

Chicago Urological Society,

MEETING, OCTOBER 21, 1915.

The Chicago Urological Society met at the Hotel La Salle October 21, 1915, with the President, Dr. Herman L. Kretschmer in the chair.

Dr. G. Kolischer read a paper on "Diathermia in Malignant Tumors of the Bladder."

Discussion.

Dr. D. N. Eisendrath.—I have not had experience with radiotherapy or mesothorium in bladder tumors, except to see the patients. I saw the patient Dr. Kolischer speaks of, and certainly so far as his condition is concerned, he is in most excellent shape. I can heartily endorse what Dr. Kolischer said of the action of the X-ray on superficial cancers, such as cancers of the tongue, or in preventing the recurrence of carcinoma of the breast. The results are positively marvelous where we formerly resorted to the knife in carcinoma of the tongue; cases in which the whole floor of the mouth was exulcerated, with fetor, and the tongue fixed to the floor of the mouth, the disappearance after a series of X-ray treatments is simply unbelievable unless you have seen these cases. So far I can endorse the general principles which Dr. Kolischer has stated. There was no doubt about the malignancy of the tumors, and then watching them heal over and soften up, and the whole mucous membrane in the bladder as he has described, and the tumor mass being replaced by smooth mucous membrane—I did not believe I would live to see the day.

Dr. J. Eisenstaedt.—I have seen Dr. Kolischer's work for the past four or five months, and it is encouraging in certain cases. The cases thus far have to be selected about which we can use the term encouraging. Dr. Kolischer has given me credit for making precipitins. I was prompted to do it by Dr. J. Walter Vaughan of Ann Arbor. He took me into the Harper Hospital in Detroit and showed me a woman with carcinoma of the rectum which had grown out over the gluteal area, and almost unbelievably, this woman was sitting on that apparently without pain. The pain was controlled by the use of precipitins. Dr. Vaughan does not use radiotherapy—either radium or mesothorium or the X-ray—in connection with the precipitin injections. However, these injections in his hands are seemingly very encouraging for certain cases. A report of his work came out in one of the popular magazines which had a bit too much glamor to it, but this much I believe can be said: Their manufacture is simple. An untrained laboratory man, such as I am, can make them and make them

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, February, 1916.]

accurately, and I believe in these absolutely hopeless cases if we are only able to minimize the pain, and in cases which do present hope either by the knife or X-ray treatment, we can possibly by the use of precipitins prevent the formation of metastases, and then we would have something which would prove a very valuable adjunct.

ADJOURNED.

PHYLACOGEN IN UROLOGICAL PRACTICE.*

By Frederick W. Robbins, M. D., F. A. C. S.,
Detroit, Michigan.

It may seem unnecessary at this time to refer to a method of medication that has been before the medical profession for nearly three years. If of decided value, it should have received general recognition; if not, oblivion were its proper burying ground. That it has not been generally accepted by those most competent to judge, is evident from the small number of cases treated with phylacogen, by Detroit urologists; that it has not yet passed into oblivion, the great volume of sales bears witness.

At the outset, let me confess to having been prejudiced against phylacogen, not because of any theoretical objection, but because the spirit of salesmanship seemed to overshadow a desire to give to the profession a valuable remedy with scientific reasons therefor. Detail men appeared to be under the hypnotic influence of a great mass of case reports, which to me proved little. It was months before any urologist upon whose judgment one might depend had anything to say on the subject.

Some of my confreres in general practice believed that phylacogen was of great value while others could see nothing good in it.

I do not care to discuss at length the theoretical action of Shafer's product, but in a judicial spirit present to you my impressions of phylacogen gained from observation of a comparatively small number of cases.

In acute urethritis I have little to say in favor of phylacogen. It has been continually noted, while treating complications of gonorrhea, prostatitis, vesiculitis, arthritis, etc., in which a urethral discharge has been present, that as a rule the discharge and gonococci remained, however the complication might have been influenced. Six cases of acute urethritis were treated, three without result.

To one, seven doses were given up to 2½ c.c. He left town much improved after the seventh daily dose, having taken no other treatment.

Another of this little series appeared suffering much pain, with both portions of urine turbid, Oct. 6th, 1914. He was given phylacogen minims 4 and was much relieved the following day. From this time fourteen doses from ½ c.c. to 6 c.c. were given up to Oct. 26th. Patient was discharged Oct. 28th with both portions of urine clear.

I may say that we have employed only the intravenous method, usually beginning with ½ c.c., increasing or decreasing the daily dose, attempting to produce a slight reaction.

*Read before the American Urological Association, North Central Section, Chicago, November 12th, 1915.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, March, 1916.]

Of cases of prostatitis, that is, cases in which the predominating pathology was in the prostate ten were treated. In five cases we report no result, while treatment was more or less beneficial in five. Dr. Cole reports the following case:

M. T., age 20. Urethral discharge off and on for past four years. Left Grace Hospital two months ago, where he had been treated five weeks for rheumatism (gonorrheal). Has taken 606. At present there is urethral discharge. He complains of muscular pains, especially in legs. Prostate is slightly enlarged and tender, but firm to the touch. Prostatic fluid contains pus cells. This patient was given thirteen doses of phylacogen subcutaneously, from 1 to 10 c.c. The only result seemed to be a more or less severe local reaction.

In no case do we find any distinct improvement as a result of the administration of phylacogen, in chronic prostatitis, vesiculitis or crypt infection. On the other hand, let me report a case or two:

Albert A. Noticed fresh urethritis January 9th. I saw him February 22nd. Both urines were turbid. Right vesicle and right prostatic lobe large and tender. Pulse 112; temperature 100°. Epididymis also swollen. Six doses phylacogen, ½ to 3 c.c. given. February 26th, many gonococci noted. February 27th, epididymis still large but less painful. March 2nd and 6th, urine sparkling but infiltration present in epididymis. Patient discharged.

Geo. M. On November 7th both urines turbid. Urinates every twenty minutes. Bloody discharge from urethra, contains pus and gonococci. Temperature 101°; pulse 20. Gave six doses ½ to 2 c.c. from November 7th to 12th. On latter day temperature was normal and he felt good. Not yet well. It is not necessary to report in full. This is one of a series of cases of which similar ones are frequently seen. No one can tell whether such prostates will eventuate in prostatic abscess, although I think it is the experience of all of us that rarely, even though the inflammation be acute, will an abscess form if proper treatment be employed.

Dr. Seabury reports: A. G., age 22. Gonorrhea five and two years ago. Present attack ten days ago, four days after exposure. Urethral discharge free. Has to urinate three or four times at night. Perineal pain. Prostate sensitive. Both urines equally turbid. Temperature 99.4°. August 30th, injected 100,000,000 dead gonococci and gently irrigated anterior urethra with sol. potassium permanganate.

August 31. Both urines turbid; feels better; temperature 99.2°.

Injected 200,000,000 gonococci.

September 1st. Temperature 99.8°. Irrigated.

September 3rd. Temperature 98.4°. No pain. Irrigated. Neglected himself until September 13th, when left lobe of prostate was hot and larger than right. Phylacogen minims 4 was given.

September 14th. Much better. Phylacogen, minims 12, caused chill.

September 15th. Pain gone. Prostate smaller. Phylacogen, minims 18.

September 16th. Feels so much better it is thought safe to resume local treatment. October 5th, urine clear but few pus can be expressed from prostate. Improvement marked.

E. P. R. Age 24. Gonorrhea two weeks ago, two and a half days after exposure. Been using injections of zinc sulphate, also internal treatment. There is profuse purulent discharge containing gonococci. Both urines turbid. Irrigated with potassium permanganate once a day, also gave injection of protargol 1/5 per cent. four times a day until November 10th, with complete cessation of discharge after the fourth day. On the 10th complained of perineal pain. Right lobe prostate tense and hot; is very sensitive. Was given phylacogen, five doses from minims 5 to 20 until

October 14th, when 2nd urine was sparkling and first was nearly clear. He improved steadily until well.

We think that in prostatitis one does not, as a result of the administration of phylacogen, expect any miraculous results. We believe that one can not expect any good results from its use in the chronic forms of the disease. One doubts that it has any effect in sterilizing the genital tract in acute prostatic infection, but we do feel that in the acute stages of prostatitis in connection with rest in bed and possibly the use of the psychrophore, it may be an important adjunct to treatment.

Classed as acute gonorrheal epididymitis in our series are 16 cases. Of these we believe that twelve showed marked improvement as a result of phylacogen, one doubtful and three unimproved. We realize that in the discussion of the treatment of epididymitis we tread dangerous ground, for no one appreciates better than the writer that rest alone will start many so far on the road to recovery that there need be no further thought as to medication or operation. Of the three cases not improved, one received a dose of ½ c.c. but would not accept another treatment.

Dr. Seabury reports: N. D., age 14. No previous venereal disease. Denies exposure. Gonorrhea began two weeks previous to first consultation. Had used protargol injections. Left lobe of prostate large, hard and tender. Vesicles and vas thickened. Small nodule in tail of left epididymis.

July 18th. All local treatment stopped; phylacogen, minims 4, given.

July 19th. Feels better. Node in epididymis increased in size. Vas the size of small lead pencil. Gave phylacogen, minims 8.

July 20th. Feels better, while in bed, but will not stay. Phylacogen, minims 10, given, followed by chill.

July 22nd. Epididymis large but pain less. Phylacogen, minims 15.

July 23rd. No improvement other than less pain. Phylacogen, minims 15.

July 24th. Epididymis somewhat less swollen. Phylacogen, minims 15.

July 25th. Chill and headache after phylacogen, minims 20.

Patient was out of bed August 5th, and when last seen, September 22nd, first urine was slighly turbid and second clear. In this case phylacogen did not prevent epididymis. The doctor is confident that the case was gonorrheal with no tubercular tendency.

Dr. Cole reports: H. T., age 20. Gonorrhea seven weeks ago. Three weeks later, without local treatment, left testis began to swell. After six days in Harper Hospital he was discharged. The swelling and tenderness of the epididymis nearly gone. Mild irrigations were then used and swelling recurred. When consulted there was urethral discharge, a swollen left epididymis. Left vesicle palpable and tender but prostate normal.

From September 24th to October 8th, twelve doses of phylacogen, from ½ c.c. to 10 c.c. were given subcutaneously, with no benefit. Eighteen days after first dose testis was slightly swollen, no tenderness, no discharge, but both urines were slightly turbid.

In the shortest possible manner, let me report a few other cases.

L. Right epididymitis. Three doses ½ to 1 c.c. Relief from pain the only effect.

W. Epididymitis and prostatitis. Five doses given. Improvement was steady.

M. Acute epididymitis. Temperature 100°. One dose. Much better the following day.

N. Acute epididymitis. One dose. No other treatment.

M. Acute epididymitis. Very painful. Temperature 100.5°. Four doses to 1½ c.c. were given. When discharged head and tail were still large but not painful.

P. H. Noticed left epididymis is swollen. September 23rd. When seen September 25th, patient had not slept the previous night because of pain. There was very little fluid in the tunica vaginalis but the swelling was the size of a small organge. Phylacogen 1 c.c. was given. September 26th. Pain gone; swelling much less and he left the hospital that afternoon.

G. H. September 12th. Moderate swelling of left epididymis. Temperature 100.4°. Phylacogen ½ c.c. given. September 14th. Much improved. September 20th. Urine clear. Small nodule hardly noticeable in epididymis.

H. B. July 13th. Pain first noticed last evening. Is sick. Pain in back and left flank. Left testis painful and swollen. Not large. Phylacogen ½ c.c. given. Went home and slept. July 14th. Reports great relief. Eight doses given to July 28th. Urine clear. Feels good.

D. M. Three months ago was in Chicago Hospital two weeks with swollen left testis. I saw him January 25th. He had pain and great tenderness in swollen left testis. Was given two doses, ½ and 1 c.c. January 29th. Patient was walking about with little pain. In this case swelling had decreased and patient noticed a marked improvement.

F. V. First noticed pain and swelling two weeks before entering hospital. On February 23rd, right testis was found to be large and tender. Four doses of phylacogen from 1 to 3 c.c. were given. For some reason temperature went to 104° on the 25th and on the 26th with temperature 103.2°, phylacogen was given. Temperature went to 104.4°, then dropped in a few hours to 97.6°. Patient then improved rapidly and was discharged March 1st.

J. S. Patient noticed right testis swollen May 13th. I saw him May 18th. Then the right side was greatly swollen, red and painful. Phylacogen was given for the next five days and patient kept in bed. On the 19th testis was less tender and smaller. On the 20th all symptoms had decidedly improved; on the 21st pain had gone and he was discharged on the 24th, the swelling having nearly disappeared.

This was a fit case for a Hagner but patient left the hospital about the same time as did another man upon whom I had done a Hagner. Both were well marked, acute cases, with just about the same conditions present. Both were well pleased with the results of their treatment. Although I am sure that some cases are better and more conservatively treated by an early Hagner, still I am quite certain that others, probably many, if placed in bed and given phylacogen, will promptly recover without a surgical operation. I do not think I am always able to determine at the outset just the cases upon whom I should operate and those that I should treat more conservatively. My feeling at the present time as to the indications in epididymitis is that there are four: Rest in bed with support of the scrotum, saline cathartics, phylacogen and, if pain persists for twenty-four hours, epididymotomy. Many patients, when first seen, will allow an operation, but few will consent on the second day.

Gonorrheal Arthritis.—Of my sixteen cases, in one there was no improvement; questionable in four, and marked in eleven.

Dr. Smith reports case unimproved as follows:

Frank L., aged 23. Gonorrhea six and two years ago. About one month after last attack commenced to have pains in both ankles and knees, also wrists and shoulders. At time of first consultation pain was present in both ankles

and heels. Both hands were swollen and deformed. Wassermann was negative, but complement fixation for gonorrhea positive. From October 4th to November 7th, twenty-three injections in size from minims 2 to 7 c.c. were given, absolutely without benefit.

Of the four cases reported, benefits doubtful, one was not completely reported; another was given three doses and improved but was transferred from hospital to county house before a reliable report could be entered. A third, seen in consultation, was seriously sick, had been given mixed vaccine; at my suggestion she was given six doses phylacogen ½ to 1 c.c. All but one produced chill. Temperature 101°, not raised after injection. She made a good recovery but it was thought that phylacogen did little more good than vaccine. Case four I will report.

Mrs. H. E. D., aged 25. Acute gonorrheal cervicitis. Seven months pregnant. February 22, complained of pain in right knee. Received 50,000,000 dead gonococci. Next day knee was worse, and cramps in lower abdomen. Up to March 3rd, used 10 c.c. anti-gonococcic serum. Pain relieved and swelling subsided; developed urticaria. March 10th pain in knees and ankle returned, 100,000,000 dead gonococci given and on the 13th 200,000,000 and patient was taken to hospital.

March 14th. Knee badly swollen; pain in both ankles and sterno-clavicular articulations, also 7th, 8th and 9th vertebrae.

March 14th. Phylacogen ½ c.c. Chill. Temperature 100.2°-103°. Some relief.

March 15th. Phylacogen 1 c.c. Chill.

March 16th. Phylacogen 1½ c.c. Chill. Rise of temperature and vomiting.

March 17th. Phylacogen 2 c.c. Severe chill. Rise of temperature to 104°.

March 18th. Phylacogen 2 c.c. Severe chill.

March 19th. Phylacogen 2 c.c. Mild chill.

March 20th. Phylacogen 2 c.c. No chill.

March 18th. Knee aspirated and injected with formalin and glycerin.

March 28th. Healthy girl delivered. Previous to delivery nothing seemed to influence the joint pains. Phylacogen given; only partial and temporary relief. Following delivery, all pain subsided. Recovery was uneventful with perfect use of knee.

Of the eleven cases in which good results are reported the following short reports seem to me quite convincing.

A. G., age 36. April 28th. Pain between shoulders in right shoulder and left sterno-clavicular articulation and left ankle. Given six doses, minims 6 to 22. Felt good May 10th and left Harper May 17th.

O. J. Severe gonorrhea four years ago, complicated with prostatitis, epididymitis, arthritis, lasting several months. Nov. 18th. History of severe gonorrhea. Both ankles painful. Left knee tender and soft. Temperature 100.6°. Left knee swollen, tender on pressure. Both ankles tender back of malleoli. Prostate normal with normal secretion. Seminal vesicles both palpable and tender.

Sodii salicyl, gr. x every 2 hours for two days. No change. Left wrist is stiff and sterno-clavicular articulation swollen and tender. Pulse 100. Temperature 101°. Respiration 27. Phylacogen, minims 8.

March 21st. Came to office feeling fine; complete freedom of motion; swelling reduced. Phylacogen, minims 10.

March 22nd. Pain relieved, same knee swollen and right wrist stiff. Unable to walk. Kept still and he was seen March 24th and given phylacogen, minims 12. Knee and foot strapped.

March 26th. Felt so well that he went to work for one-half day. March 29th. Pain in opposite knee and ankle and right wrist. Phylacogen, minims 16. March 31st. Phylacogen seven doses up to 35 minims given to April 21st, always with reaction. Back to work well and continued well after April 27th.

Dr. Smith reports T. E. Gonorrhea July, 1914. Three weeks later *rheumatism*. October 22nd. Swelling and pain of feet and heels. Acute discharge. From October 22nd to November 9th, fourteen doses of phylacogen were given from ¼ c.c. to 9 c.c. Irrigations were also given. Patient discharged November 10th, cured of discharge and rheumatism. It seems to me that great improvement was felt by patient or he would not have returned to receive the heavy doses every day.

J. B. After epididymitis, right wrist and left ankle swelled and becoming painful. Three doses given, 2 to 2.5 c.c. given after February 24th. Discharged March 3rd, relieved of pain.

V. S. Gonorrhea three weeks ago. Pain in knees, swelling of joints. Tenderness at inner condyle of tibia. Eight doses ½ to 3 c.c. from February 9th to February 20th. Walks easily. No swelling, no pain. Improvement noted from first injection. Discharge continues.

R. B. Rheumatoid arthritis at age 10, also at 18 and 22. This attack began January 1st, 1915. Pain passed from joint to joint. Salicylates do not relieve. January 9th, both ankles swollen and hot. Comp. fixation test for gonorrhea positive. Phylacogen 1 to 4 c.c. given, in all six doses. No chill or rise of temperature. After fourth dose swelling gone. Treatment began January 9th; was greatly improved by the 16th and patient discharged feeling good on the 21st.

S. B. Gonorrhea one month ago. Pains without swelling in left side of chest, left ankle and hip. Pain had been severe for a week previous to treatment. This markedly decreased after second dose. After nine doses from December 9th to December 27th, patient was discharged much improved.

Dr. Cole reports a typical case of gonorrheal arthritis going on to complete recovery after thirteen injections from ½ c.c. to 4½ c.c.

Without wearying you with further details, I would conclude from these meagre observations that phylacogen in acute gonorrheal arthritis is a specific and may be given with great assurance of success.

That in epididymitis phylacogen is of great value in many cases. It is not, however, to be relied on to the exclusion of operative treatment.

That in acute prostatitis the results have been sufficiently encouraging to lead one to further experimentation.

In chronic prostatitis one must depend upon old time tested methods of treatment; probably phylacogen is of no value.

Finally, the writer finds no place for phylacogen in acute gonorrheal infection of the urethra.

In the above compilation we wish to thank Drs. Cole, Smith, Dodds, Keane and Seabury for their collaboration.

SYPHILIS OF THE PROSTATE.*

By A. Ravogli, M. D., Cincinnati, Ohio.

A few years ago a chapter on the syphilitic affections of the prostate was dismissed with these remarks, "Observations on affections of the prostatic gland are also very few in number." Eugene Fuller (1) emphasized this statement by writing that this gland seems to be peculiarly exempt from syphilis in any of its stages of development. Guyon and Leanois on Prostatismus referred the prostatic hypertrophy to a process of arteriosclerosis. In so far that arteriosclerosis more frequently affects individuals who have had syphilis, in this distant way some authors have tried to connect syphilis with prostatic affections.

The difficulty of ascertaining the syphilitic origin of the prostatic affections rests in the frequency of the allied disease gonorrhea, which often is found in the same patient at the same time. It cannot be denied that the principal cause of prostatitis, often acute or chronic type, is gonorrhea with its consequences, strictures, cystitis, etc. On the other hand nobody can deny that syphilis, which affects every tissue of the human body, spares the prostate for the only reason that it can not be easily seen. Reliquet, Rochon, Duhot, Grosglick and others have referred to cases of syphilis of the prostate. Michailoff (2) reported a case of recurrent hematuria in a woman, where the cystoscopic examination showed many superficial ulcerations in the mucosa of the bladder. Wassermann positive, specific treatment cured the hematuria. A case of retention of urine due to syphilis was reported by Mucharinsky (3). The prostate was enlarged, the urine cloudy. Cystoscopic examination showed some hypertrophy of the middle lobe of the prostate, and in immediate proximity to the bladder was found a deep ulcer. The mucous membrane of the bladder showed marked hyperemia, in the form of reddish areas, round, suggesting erythema. The diagnosis was that of secondary syphilitic erythema of the bladder, and syphilitic ulcer of the prostate. Antiluetic treatment showed beneficial results, the ulcer healing up in a short time.

Bransford Lewis (4) in some obscure forms of prostatic obstruction pointed to the possibility of local luetic affections of this organ. In many cases diseases of the cord and of the nervous system from lues are first revealed through disturbances in the urination, while other symptoms had passed unobserved. In many cases the Wassermann test is changing the significance of some urinary obstructions, and a syphilitic condition may be found at the bottom to explain some prostatic alterations.

*Read before the American Urological Association, North Central Section, Chicago, November 12th, 1915.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, March, 1916.]

In some obscure cases of urinary retention, when the Wassermann is positive, Philip Kreissl has obtained brilliant results by the intravenous administration of salvarsan. In a series of cases, which he kindly showed me, the antisyphilitic treatment had been very valuable. It must be combined with local treatment which he does by injecting into the prostatic urethra a mild solution of 1 to 5,000 of silver nitrate.

It is not only in acquired syphilis that symptoms of urinary retention may be produced, but also in hereditary lues it is found that this is the cause of urinary disturbances difficult to diagnose. Enuresis nocturna in boys and girls has been referred to hereditary lues. Indeed Bransford Lewis refers to cases of retention of urine without obstruction, in which only the Wassermann test was able to explain the true origin. Some cases have to be considered as cases of incoördinative retention, which is the result of spinal degeneration. On account of impaired action on the vesical nerves the function of the detrusor is incomplete and it simulates a relative sphincteric obstruction.

The object of this paper is to call attention to the syphilitic manifestations and to syphilitic process which, in the various stages of the disease, may affect the prostate in the same way that any other organ of the body is subject to its attacks. We will therefore consider the manifestations of syphilis in the prostate in the early period of the disease, and then in the late gummatous period.

In the secondary period of syphilis the prostatic urethra is affected with superficial ulcerations of the condylomatous or papular type, which are revealed by the urethroscope. In these cases the introduction of a sound is very painful, and although done with the greatest care it causes bleeding, due to the excoriating of the granulations on the surface of the ulcerations. To this condition we attribute bloody ejaculations, since in the very few instances we have seen it was in individuals whose principal trouble was syphilis.

Syphilis in the secondary period affects the tract of the prostatic urethra in the form of a superficial ulcerative process. These superficial ulcerations may remain limited to the prostatic urethra, while in some cases they may extend to the bladder, as shown by the cystoscopic examination.

From a number of clinical cases we select one in which the syphilitic manifestations in the prostatic portion of the urethra were clear.

A. S., 32, married, telegraph operator, robust, in good physical condition. He has had several gonorrheal attacks, of which he has been cured. Some two years ago he had syphilitic infection, for which he took mercurial treatment and one full dose of salvarsan.

He asked for medical attendance, in order to be relieved of a painful and frequent micturition, which prevented him from sleeping and interfered with his work. The examination of the urine in two glasses showed first urine cloudy with shreds and some mucopus, second urine less cloudy, the last drop expelled with pain and tenesmus. A sound

was introduced to ascertain the condition of the urethral mucosa. In withdrawing the sound it gave the sensation of some hardening in the bulbar region. Examination *per rectum* found the prostate slightly enlarged with a few irregular nodules in its surface. The posterior urethra and the bladder was irrigated with a solution of potassium permanganate 1 to 5,000. From this treatment the patient had no relief, and was compelled to remain in bed the following day. After the acute symptoms had subsided, by means of the urethroscope there were found two ulcerations of the size of a lentil, round in shape and easily bleeding, in the lumen of the prostatic urethra. The ulcerated spots were touched up with 3 per cent. solution of nitrate of silver. A few days after by means of the cystoscope the bladder was examined which showed only some hyperemia towards the urethral end. The patient had a positive Wassermann and was again subjected to antiluetic treatment. By means of the urethroscope the ulcerations in the prostatic urethra were treated locally and in a short time healed up completely. The urine returned clear, the frequency diminished, and the patient returned to his work.

Several other cases of the same kind could be reported, where a luetic ulcerative process was found in the prostatic urethra, all of which by local and general treatment were benefited. The presence of ulcerations in the prostatic urethra is an open door for bacterial infection to the body of the prostate causing prostatitis, which may end in an abscess.

In the tertiary stage of syphilis the prostate may be affected in its lobes in form of gumma causing the swelling of the affected lobe, and producing some obstruction. The gumma is developed in the parenchyma of the gland, and undergoes its pathological changes, either by reabsorption or by breaking down. A well defined case occurred in our practice.

P. N., an Italian barber, 45, had suffered from syphilis for over 15 years. For a long time no symptoms had returned. One of his children had a periosteal gumma of the right arm, which yielded to mixed treatment. He came to be treated on account of an unbearable pain deep in the perineum and rectum together with tenesmus of the bladder and rectum. He complained of frequent urination together with pain, no relief after urinating; there remained some urine which could not be expelled on account of pain. The stream of urine was small, without propulsion; difficult to start, ending in drops. A sound could not be introduced on account of pain. The exploring finger in the rectum found a swollen prostate bulging like a ball, painful to the touch, somewhat softer in the middle.

It was decided to incise the perineum and perform a prostatotomy. Under a general anesthesia the perineum was opened, the prostate isolated, the capsule incised and bloody, grumous, purulent matter removed. The surface was cleaned with dull curette, and packed with iodoform gauze.

In a short time recovery was perfect. Wassermann proved slightly positive, and antiluetic treatment with grey oil and potassium iodide was instituted. The man is working every day and has never had any further urinary disturbance.

This case has been reported as one of syphilitic gumma of the prostate, as it seems to show clearly the luetic origin. Other cases have been treated where no surgical interference was required and an antisyphilitic treatment especially with salvarsan was able to relieve the urinary troubles.

An interesting point is to find the differential characters between syphilitic prostatitis and gonorrheal prostatitis. The prostate is a point of predilection for the gonococci, which enter its excretory ducts and the ejaculatory ducts. Nearly all the patients who have suffered with chronic gonorrhea of the posterior urethra have suffered with chronic prostatitis. The combination of both infections may have some influence one on another, as a result of *pars minoris resistentiae*. Yet in the individual cases a differential diagnosis is made. by the fact of the presence of syphilis, by the persistence of the symptoms in spite of the antigonorrheal treatment, by the urethroscopic and cystoscopic examination, which shows the presence of limited ulcerations in the prostatic urethra. In the case of a prostatic abscess resulting from gonorrheal or from any other bacterial origin the inflammatory process is much more acute, and soon breaks either into the perineum or rectum.

In conclusion we believe that the prostate is not immune from syphilitic attacks, that in the secondary period the prostatic urethra shows in its mucosa local papular superficial erosions of the condylomatous type, in the tertiary period the parenchyma of the gland is affected in the form of gumma with all its consequences.

REFERENCES.

1. *Annales des Maladies des Organei Gen. Urin.*, Feb. 1889, quot. by Fuller.
2. Michailoff, N. A.: Syphilis der Hernblase und der Oberen Harnwege. *Zeitschrift fur Urologie*, 1912, 2 Heft., p. 215.
3. Mucharinsky, M. A.: Zur Frage der Harnblasen Syphilis. *Zeitschrift f. Urologie*, 1912, H. 5, p. 376.
4. Bransford, Lewis: Studies in Obscure Forms of Prostatic Obstruction and Vesical Atony. *Annals of Surgery*, March, 1915, p. 277.

CLINICAL REVIEW OF 240 CASES OF NON-SURGICAL INFECTION OF THE KIDNEYS AND URETERS.*

By Gilbert J. Thomas, M. D., Rochester, Minn.,
Mayo Clinic.

In an attempt to discover the predisposing factors, if any, in non-surgical infection of the kidneys and ureters and to determine the relative value of the present modes of treatment I have considered in this study, antecedent infections, previous operations, etc. The symptoms of onset and those of most common occurrence during the progress of the disease have been analyzed together with cystoscopic and bacteriologic findings. Stones in the bladder, kidney or ureter and obstruction in the lower urinary tract have been excluded.

Such infections, except those due to obstruction in the lower urinary tract, are hematogenous in origin. In the infections due to obstruction the lymphatics probably play a part in carrying the infection to the kidney. It is possible that they, also, are of hematogenous origin and that obstruction lessens resistance by mechanical means and is the predisposing factor, not the cause, of the infection.

Brewer (1) states that all renal infections are hematogenous, including those that come from an infection primary to the bladder. Sweet and Stewart (2) after careful anatomic and experimental study have concluded that the lymphatics of the bladder, ureter and kidneys anastomose rather freely and that they can carry infection from the bladder to the kidney. They believe this route of infection is frequently the one by which the pelvis and parenchyma of the kidney become infected from the infection in the bladder. Cabot (3) and others believe that in cases in which there are a great many elements in the urine and few symptoms are lymphatic in origin, while those showing few such elements and marked general symptoms are hematogenous in origin.

The present study comprises a review of 240 patients who received urologic treatment in the Mayo Clinic from January 19, 1910, to January 19, 1915; 32.8 per cent. were women and 67.2 per cent. men. The average age of onset was 30.3 years. The duration of symptoms ranged from two weeks to twenty years. Twenty-six per cent. of the patients did not give a history of previous diseases; 18 per cent. had infections of the genital tract, giving a history of gonorrhea or pelvic infection; 12 per cent. had had a previous attack of typhoid fever; 9 per cent. gave a history of childhood infections; 6 per cent. of pneumonia; 3 per cent. of tonsillar infection; 4 per cent. of arth-

*Read before the American Urological Association, North Central Section, Chicago, November 12th, 1915.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, March, 1916.]

ritis and rheumatism; 4 per cent. of scarlet fever; 2 per cent. of empyema of the antrum and chronic abscesses; 2+ per cent. of syphilis, and five gave a history of severe abdominal injury. The remaining patients gave histories of infections as follows: Lung, one; ruptured urethra, one; phimosis, one; dysentery, one; malaria, four; pregnancy, two; etc.

Of the 240 cases the first symptom complained of was frequency of urination; it was also the most common symptom, being present in 76 per cent. of cases, and varied in intensity from voiding every ten minutes to one or two times per night. In 37 per cent. pain was the primary symptom. In the analysis of pain as a symptom it was found that severe lumbar attacks were complained of in about 20 per cent. of all the cases; a dull ache across the lumbar area and sacrum was frequently described. Epigastric, lower abdominal and vesical pain was frequent. Painful and burning urination occurred at some time during the history in 60 per cent.

Patients noted hematuria as the first symptom in 7 per cent. and it was noted at some period of the history in 41 per cent. of the cases. In 2 per cent. temperature and chills were the first symptom, these symptoms being present in 25 per cent. of cases. Pyuria was a primary symptom in 2 per cent. An appreciable loss of weight was noted in 41 per cent. Gastric and duodenal lesions were suspected in a number of cases because of reflex pain which was probably of renal and ureteral origin. In a small percentage these attacks were persistent, unrelieved by urologic treatment, and required surgical measures.

Cystoscopic Diagnosis.—Cystoscopic examination demonstrated the existence of bilateral infection in 174 (73 per cent.) patients. The infection was confined to the right side in 67 per cent.; in eighteen (7 per cent.) the infection was on the left side only. Fifty-one cases were diagnosed as pyelitis, five of which were of a chronic, bleeding type. In our experience the differential diagnosis between pyelitis and pyelonephritis has been rather difficult. Acute, repeated attacks, with microscopic findings in the urine, that quickly subside with or without treatment, may be regarded as infections of the pelvis alone. The chronic refractive type which shows few elements in the urine may be considered as pyelonephritis. The infection found in pregnant women is usually a pyelitis; it is to be noted that these patients are relieved as soon as the uterus is emptied and good drainage restored. In only a few of these cases does the parenchyma become involved. An illustration of the somewhat acute, temporary infection of the pelvis, or pyelitis, is shown in the many instances of post-nuptial infection. These cases quickly clear up by means of urotropin and other simple methods because the parenchyma is probably not involved. We have observed two very interesting cases of post-operative infection of hematogenous origin in

which the bacillus tuberculosis was found to be the causative organism. Both patients developed acute cystitis and showed bacilli in specimens of urine from the bladder. In one there were tubercle bacilli in both ureteral specimens. These patients were relieved by urinary antiseptics and hygienic treatment. Repeated examinations after the acute symptoms had subsided failed to demonstrate the organisms. One patient has remained well for one year and no focus of infection can be found. There had been a tonsillectomy a short time preceding the onset of cystitis. One patient was well one month after the acute onset. Guinea-pig inoculation was negative in one after three months.

In our hands renal functional tests have not always proved satisfactory in the differentiation between pyelitis and pyelonephritis. Equal function in the two kidneys has frequently been observed in cases in which the pyelograms demonstrated one kidney badly damaged. In those showing infection active on one side and inactive on the other, the difference in function may not be great enough to be of value. In some cases one kidney with a quantity of pus would show as large an output of the drug as the kidney with no bacteriologic or chemical findings. However, when one kidney is largely destroyed, the difference in function when using the dyes has been great enough to direct suspicion to the destroyed kidney.

Pyelogram.—The pyelogram will differentiate a marked infection of the parenchyma from one in the pelvis. Infection in the parenchyma shows but slight inflammatory changes in the pelvic outline, while a pelvic infection usually shows marked inflammatory changes. This means of differentiation has also been of considerable aid in separating the cases of actual pyonephrosis from the milder grades of infection, seven cases having been found in which one kidney was largely destroyed. It may also be of value in determining the etiologic factor. Congenital anomaly in the urinary tract, which may have been an etiologic factor, was found in four cases. Obstruction in the lower ureter was demonstrated by means of the pyelogram in several cases as the probable cause of renal infection.

Cystitis.—A marked degree of cystitis was noted in 16 per cent. of the cases while, as mentioned above, the most common symptom (frequency of urination) was noted in 76 per cent. of cases. The bladder does not always show marked signs of infection, as is shown by this series wherein 25 per cent. had no cystoscopic evidence of cystitis. All of these patients, however, had varying amounts of pus in the urine, yet 34 per cent. had no symptoms referable to the bladder. A considerable number of cases of renal infection have been diagnosed only after careful and repeated cystoscopic examinations. Many showing only a few pus cells at the time of the first examination, on re-examination showed larger amounts of pus from one or both kidneys

and vice versa. A number of patients with irritability of the bladder and no microscopic findings in the urine have shown bacterial growth from catheterized urine from both kidneys. In our experience cystitis is not a necessary finding in renal infection. Vesical irritability is a more constant sign than cystoscopic evidence of cystitis but both these findings may be absent in the presence of a renal infection.

Bacteriologic Examination.—Records of complete bacteriologic examinations were available in 95 cases; 63 per cent. were of the colon group. The other organisms were pyocyaneus, micrococcus urea, pneumococcus, streptococcus and the staphylococcus group. It is probable that the bacillus coli is a secondary invader in a large percentage of these infections. The offending organism and its toxins probably lessen the resistance of the kidney so that the colon bacillus, which is constantly passing through the kidney becomes pathogenic. Many writers are of the opinion, however, that the pyelitis of pregnancy and the infections which accompany constipation are primarily of colonic origin. The stagnation due to pressure from the uterus on the intestine and resulting constipation are factors which probably predispose the kidney and ureter to colon infection. The pressure of the uterus on the ureters interferes with their function and thus lessens their resistance to infection.

When symptoms are suggestive of tuberculosis, guinea-pig inoculation is desirable. This was found necessary to complete the diagnosis in 48 cases. In our experience absence of pus or no growth on culture does not necessarily mean a single infection. Inactive infection has frequently been found on one side by microscopic and bacteriologic examinations which could be demonstrated at other times as being active. It would be well to consider a non-tuberculous, non-calculous, unilateral infection as part of a bilateral condition until by pyelographic and cultural examinations one kidney has been proved to be sound.

In making cultures of urinary infections, contamination of the specimen obtained would frequently negate the value of the bacteriologic examination. Such contamination, in our experience, has been due to faulty technic in that all instruments used were not completely sterilized. Ureteral catheters are not easily sterilized as may be proved by cultures made from bits of catheters which are in daily use and which are thought to be sterile. The ureteral catheter should be boiled or should be made sterile in some manner so that when sections are introduced into several culture media no growth can be obtained. The use of unsterile lubricants is also a frequent source of contamination. Catheters or containers which have just been removed from an antiseptic solution have been the frequent cause of a report of no growth when later examinations demonstrated organisms

present. A small amount of such solutions in culture media will prevent growth. Cultures should be grown both aerobically and anaerobically.

Treatment.—A careful search for foci of infection, such as tonsils, teeth, abscesses, furunculoses, bone infections, etc., should be made before any local or urologic treatment is instituted. Chronic abdominal complaints and any pathologic condition which might harbor infection should be searched out and completely eradicated. As mentioned above, 26 per cent. of patients gave a history of having had no serious illness or infection which might pave the way for chronic renal disease. It is safe to assume that many of these patients had forgotten the furunculosis, the severe attack of tonsillitis, the chronic suppurative ear, the chronic infectious diseases of childhood which at the time seemed trivial. It is also probable that organisms frequenting tonsils, carious teeth, appendix or gallbladder may be so changed in charatcer, as Rosenow (4) has demonstrated, as to have a special affinity for the urinary organs at certain times. The ever present colon bacillus quickly outgrows the organism of primary infection so that in most chronic cases the true offending bacteria are not always found. Autogenous vaccines were given when obtained in pure culture and when the tolerance of the patient would permit.

Local treatment consists of regular lavage, at four or five-day intervals, of the kidney pelvis, ureter and bladder. For this purpose silver nitrate, argyrol, colloidal silver, protargol and silver iodid have been used. Many of the patients were given urinary antiseptics by mouth. Silver nitrate, beginning with .5 to 1 per cent. in strength and increasing to 2 or 3 per cent. has proved the best solution for lavage of the pelvis. Aluminum acetate, in our hands, did not prove efficacious and was unsatisfactory because of the reaction it frequently occasioned even when freshly made and diluted. Weak solutions of argyrol and the other colloidal silver solutions were used in the severe acute infections where reaction was feared.

Surgery becomes the logical treatment when a single infection is persistent with marked constitutional symptoms, even in the presence of mild infection on the other side. Inflammatory obstruction of the ureter, pyelitis granulosa with persistent bleeding and extensive distention from infection with destruction of renal tissue are also indications for surgical interference.

To ascertain the effect and permanency of the different methods of treatment a circular letter was sent to each of our patients and 150 definite answers were received. A tabulation of these answers shows that the condition was stationary in 44 (29 per cent.) of the patients; improved in 70 (46 per cent.); and that recovery was complete in 28 (18 per cent.). Eight of these patients have since died and the reports show that in over 50

per cent. the fatal outcome was probably due to severe renal lesions.

A more minute analysis of these answers relative to the combinations of treatment employed showed some interesting facts. Of the 26 patients in whom vaccines alone were used, six have apparently recovered, 11 have improved and five showed no improvement. In 8 patients in whom lavage of the pelvis alone was used by any of the above-mentioned solutions two recovered, two improved and four remained stationary.* Urinary antiseptics used alone in 31 cases caused four apparent recoveries, thirteen improvements and nineteen cases unimproved. With the combination of vaccine and pelvic lavage, only two patients recovered, twenty improved and nine did not improve. Thirty-one patients in all were so treated. Vaccines and urinary antiseptics in nineteen patients showed six recoveries, eight improvements and five unimproved. Eight patients in whom vaccine, lavage and urinary antiseptics all were used showed two recoveries, four improvements and two non-improved. Eight patients received no treatment, three of whom apparently recovered, two improved and three remained stationary. Seven patients were operated on, four showed surgical lesions in the urinary tract; two recovered completely and five improved. The tabulated results of treatment are as follows:

Method of Treatment	Recovered	Improved	Stationary	Died
Autogenous vaccine only	6	11	5	—
Pelvic lavage only	2	2	4	—
Urinary antiseptics only	4	13	19	—
Vaccines and Lavage	2	20	9	—
Vaccine and urinary antiseptics	6	8	5	—
Lavage and urinary antiseptics	0	1	1	—
Vaccine, lavage and urinary antiseptics	2	4	2	—
Bladder lavage only	1	—	—	—
No treatment	3	2	3	—
Surgery	2	4	1	—
Death from renal insufficiency	—	—	—	4
Death from other causes	—	—	—	4

It will be noted in the above tabulation that the greatest percentage of recoveries is found in the "Vaccine only" column. The patients who had this treatment and had no lavage of the pelves had very mild infections. Many of them showed a small amount of pus in the urine and cultures were obtained only after repeated trials. These patients would probably have recovered without treatment.

The rather large group of patients who received antiseptics only were advised to have either pelvic lavage or vaccine, but as this treatment is somewhat troublesome and could not be obtained at their homes they continued the medicine by mouth only.

Where lavage was used, the number of com-

*Silver nitrate was used in over 90 per cent. of cases where lavage was practiced.

plete recoveries is small. These cases have not been considered free from infection until the urine was free from microscopic pus and until repeated cultures were negative. As most of our cases were irrigated with silver nitrate, pus could be obtained at any time, but cultures were repeatedly negative after the treatment had progressed for varying lengths of time. It is probable that the silver nitrate was the cause of microscopic pus in many cases in this group and that as many of them were culturally free from organism they should be considered temporarily cured.

Conclusions.

1. Infections elsewhere in the body are predisposing factors in infections of the kidney and ureters.

2. Seventy-three per cent. of these infections are bilateral at the onset of the disease. The lack of pus or bacterial growth of the catheterized urine does not always mean non-infection, but non-active infection.

3. Pyelography and guinea-pig inoculation may be necessary to identify tuberculous infection and to differentiate the unilateral from the bilateral infection. The renal functional tests were frequently not of much value in differentiation between the locations of the infection.

4. Very careful technic should be followed in obtaining specimens for culture as contaminations frequently occur and negate the bacteriologic findings.

5. Treatment affords relief or cure in 64 per cent. of cases and should always be carried out in some form. No single method will give results in every case, so that all methods should be tried. Pelvic lavage has probably been the most satisfactory but whenever possible should be used in conjunction with an autogenous vaccine. Nephrectomy, when necessary, affords complete recovery from general symptoms and improvement or cure of the infection in the remaining kidney.

REFERENCES.

1. Brewer, G. E.: Hematogenous Infections of the Kidney, a Summary of Our Present Knowledge. *New York Med. Jour.*, 1915, CI, 556-60.

2. Sweet, J. E. and Stewart, L. F.: The Ascending Infection of the Kidneys. *Surg., Gynec. and Obstet.*, 1914, XVIII, 460-69.

3. Cabot, H.: Abstract of Discussion of Paper by Cunningham, J. H.: Acute Unilateral Hematogenous Infections of the kidney. *Jour. Am. Med. Assn.*, 1915, LXIV, 237.

4. Rosenow, E. C.: Transmutations Within the Streptococcus-Pneumococcus Group. *Jour. Infect. Dis.*, 1914, XIV, 1-32. Elective Localization of Streptococci. *Jour. Am. Med. Assn.*, 1915, LXV.

TREATMENT OF NON-TUBERCULOUS INFLAMMATIONS OF THE SEMINAL DUCT.*

By R. W. Staley, M. D., Cincinnati, Ohio,

Instructor in Genito-Urinary Surgery, University of Cincinnati.

The treatment of acute epididymitis has in recent years received considerable attention, and particularly so in reference to its surgical aspects. Some enthusiasts would, if they could obtain permission, incise every inflamed epididymis, be it ever so slightly involved, while others of an extremely conservative turn of mind would never consider operative interference at all, even in the fulminating cases where there is great swelling and much pain. There can be no question that many of the mild cases will resolve fairly promptly, and not greatly inconvenience the patient when treated by our old palliative measures; but one should have an open mind and be ready to recognize those cases in which such procrastination will prolong the patient's suffering, and possibly lead to other sequelae unless the pus be evacuated.

Epididymotomy is such a simple little operation that it seems ridiculous to have to make a plea for its recognition; nevertheless, there are not a few genito-urinary operators who have never tried the procedure and who are skeptical as to its merits. It can be done in the office or dispensary under local anesthesia, the patient going home immediately afterward. In our experience the relief from pain has been most prompt even in those cases where the punctures brought forth no pus. Resolution has invariably taken place more rapidly than with the old expectant routine. Where the multiple punctures into the epididymis are made through a short scrotal incision, no sutures will be required. A comfortably fitting suspensory or athletic supporter serves admirably in retaining the dressings.

In order to avoid the open incision, it has been proposed to aspirate through a needle plunged into the inflamed organ.

It is difficult to understand just how these needle punctures can satisfactorily evacuate the pus in the epididymis itself, though it is conceivable that drainage of the hydrocele which is usually present, by lessening the tension, will give relief of pain. The reasonable position to take is, that if an epididymitis is severe enough to justify any operative attempts, the most surgical one should be employed.

Though experience has taught us that urethral treatment is best omitted during the course of an acute epididymitis, theoretically it would seem that we are losing valuable time in so doing. Several

*Read before the American Urological Association, North Central Section, Chicago, November 13th, 1915.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, March, 1916.]

cases having epidymal involvement were allowed to continue their urethral injections, and although there was no extension of the disease to the other epididymis in a single instance, it was quite evident that the whole process was prolonged.

There is a type of relapsing epididymitis which I believe is due to a focus resident in the epididymis, and is not dependent upon prostatic, vesicle or posterior urethral infection. The usual history of these cases is that after some exertion, trauma or prolonged sexual excitement, the epididymis is tender to touch, then gradually begins to swell. There is never so much swelling, nor is the pain as acute as in the ordinary form of the disease resulting from extension of urethral infection. The urine may remain clear all through the attack, while the symptoms of frequent and urgent urination are usually entirely absent. That these cases are not tuberculous seems a logical assumption because they never break down and form fistulae, and are always negative to tuberculin tests.

The only treatment which can be depended upon to be successful is total extirpation of the affected epididymis. As it is most likely that the repeated inflammatory attacks have obliterated the lumen of the vas and brought about a one-sided sterility, the patient will suffer no great loss from the operation.

Acute deferentitis is always preceded by posterior urethral, prostatic or vesicle inflammation and usually terminates in epididymal involvement. Proper treatment of the more important localizations, together with hot applications over the painful cord are to be depended upon to make this a transitory affection, and one which rarely calls for the knife in its management. When abscess formation does take place, however, it should be promptly opened and drained in order to prevent extension into the peritoneal cavity.

It is impossible to consider the treatment of inflammatory processes in the seminal vesicles apart from like conditions in the prostate. Where the vesicles are involved the prostate is surely likewise affected even though it be to so slight a degree that the examining finger is unable to detect anything abnormal.

There can be no question but that the inaccessibility of these organs has militated against the more frequent employment of surgical measures in the acute conditions to which they are subject. Upon the whole this has been a good thing for our patients' welfare as it has deterred many of us from attempting measures which could only end in disappointment. Imagine the absurdity of trying to drain the prostate in a case of follicular prostatitis. The whole gland would have to be riddled in order to reach the many small foci. In acute seminal vesiculitis early incision and drainage might be productive of good results if it could be done easily. However, as both prostatotomy and vesiculotomy are operations of some magnitude most of us will

content ourselves with palliative measures in the mild or moderately severe cases, reserving surgery for those in whom well defined abscess can be made out by the examining finger, or the persistence of grave constitutional symptoms makes it imperative that something be done to liberate the suppurating focus.

Either Fuller's incision or the open perineal dissection as done by Young and Squier will be necessary in order to reach the vesicles, but a less extensive operation will suffice in dealing with prostatic abscess. A slight modification of lateral lithotomy in which the incision instead of opening the urethra goes into the corresponding lobe of the prostate, is a method to be recommended. The unsurgical method of opening these abscesses through the rectum should never be practiced because of the liability of establishing urethro-rectal or vesico-rectal fistulae.

The non-operative treatment of acute prostato-vesiculitis that has proven itself of great service is heat applied to the prostatic and vesicle region by means of the psychrophore. Rectal irrigations through the ordinary fountain syringe tube are not easily borne because of the irritation of the anus caused by the out-going hot water. Most of the patients with acute conditions in the prostate and vesicles are sick enough to want to be in bed, which is certainly where they should be. High fever should be taken care of in the usual manner and the diet ought to be that of a patient suffering from any acute febrile disturbance. Retention of urine is the only occurrence which calls for the employment of urethral instrumentation, and all injections, even in the anterior urethra had best be omitted during the height of the disease.

Just when to begin massage in these cases is always difficult of determination. If we start too soon there is great danger of causing an extension to the epididymis, or an acute exacerbation of the local condition, while if delayed too long valuable time will be lost. When used at all in acute cases, the massage should be very gentle, no effort being made by severe manipulations to cause a flow of pus from the urethra. After the acute symptoms have subsided, massage becomes our best weapon of offense, more pressure being exerted at each treatment in accordance with the patient's tolerance.

It takes a little more time but is certainly a source of satisfaction to perform massage upon a bladder containing four to eight ounces of some clear antiseptic fluid, such as solution of boric acid. After the manipulation when the patient voids the bladder contents into a glass, ocular inspection will give fairly accurate data as to how much progress is being made. There is a definite value to dilatation of the posterior urethra in the declining stage of prostato-vesiculitis, which is not all due to the emptying of the prostatic ducts and follicles, but arises from the freeing of the ejaculatory ducts of

plugs of detritus, thus promoting better drainage of the ampullae and vesicles when they are massaged.

Irrigation of vas, ampulla and vesicle by the Belfield method has also been of service in the subacute and declining stages, especially in those cases where great quantities of inflammatory debris are expressed at each massage. Collargol, however, should not be used because of its tendency to form curds when mixed with pus, which in this instance would defeat the purpose of the irrigation. It is quite a nice little point as to what strength the antiseptic should be and how much of the solution to inject. It is wise to start with mild solutions and small quantities, say about one c.c. of 1/8 per cent. protargol or 5 per cent. argyrol, gradually increasing both strength and volume at each subsequent injection, always trying to avoid vesicle cramp which is to be taken as an indication of over-distension.

Some operators have been disappointed in the results obtained from this method, but there is no doubt that the failure was due to an improper selection of cases and a lack of thoroughness in carrying out the treatment. Any case severe enough to warrant the use of this measure at all, will certainly require more than one irrigation for we might as well try to cure a cystitis, or violent posterior urethritis with one through and through bladder lavage.

In the chronic cases, where a gleety non-specific discharge is the only complaint, satisfactory progress will usually be made under the routine measures of dilatation, massage and irrigation, though it is rather difficult to keep these patients from becoming neurasthenic.

As a rule, the type of vesiculitis in which impotence is a prominent symptom makes very poor progress when treated by massage. In these cases the inflammation has extended beyond the confines of the vesicles and invaded the surrounding structures. This perivesicular sclerosis has a tendency of obliterating the lumen of portions of the vesicles, so that massage is ineffective in expressing the retained secretions. Irrigation through the vas is likewise unavailing for the same reason. A carefully performed vesiculotomy in which as much attention is paid to the perivesicular infiltration as is to the intravesicular infection, will sometimes be followed by restoration of sexual function. Though we may feel that mere sexual impotence is an ailment which does not justify surgical interference, many individuals so afflicted will gladly undergo operation in the hope of relief from what is to them an intolerable condition.

Sometimes urinary symptoms overshadow the sexual in these sclerosing cases. These symptoms are produced by the efforts of the detrusors to overcome the resistance of the splint-like perivesicular exudate, which in some instances extends well up under the trigone and nearly surrounds the neck of the bladder. Such a patient falling into the hands

of one uninitiated, would most likely be classed as a prostatic because of the presence of something hard in the rectum. Any operative attempt on the prostate in a case of this type which does not take into consideration the vesicles as well, is doomed to be a failure. A thorough drainage and liberation of the vesicles from their surrounding inflammatory investment will do much more for their real trouble than will dilatation of the prostatic urethra, punch operations or attempts to remove the inflamed prostate.

The clinical entity we know as gonorrheal arthritis, is fairly well understood by the profession at large as being a systemic manifestation of a chronic focus of infection in the genital tract; but in addition to this there are a number of other conditions whose relationship to seminal duct disease is not so obvious. This obscurity is doubly difficult to penetrate where there is a negative history regarding urethral infection. When we consider how rarely a sexual history is taken, or a rectal examination of the male pelvic organs made by the general practitioner, it is not to be wondered at that the causative factor in some cases of recurrent headache, myalgia and neuralgia is entirely overlooked. A point which has been observed, and is in a measure to be regarded as diagnostic, is that the joint or muscle pain, or the headache is worse after the first two or three massage treatments. This phenomenon most likely results from an overdose of toxins which has been thrown into the system by the manipulation.

While it would seem that surgical attack offers the only chance of relieving these patients of their generalized troubles, we all know that our non-surgical measures do benefit many, so that in only a small per cent. of the cases will it be necessary to consider the advisability of vesiculotomy or vesiculectomy. We must keep in mind, however, that massage in these conditions is merely palliative, and though some individuals will be able to go months without treatment, relapses are to be expected from time to time which will require further attention.

The various vaccines, bacterial derivatives and phylacogens which we were so enthusiastically lauding a few years ago, have proved disappointing in such a large number of cases that most of us go about the use of these measures in a half-hearted manner, not expecting much in the way of beneficial results. I feel sure that in great measure, the failures have been due to the difficulty in determining the exact bacteriology of the infectious processes.

Whenever the question of operation in connection with rheumatoid manifestations is under consideration, every known means should be employed to fasten the guilt where it belongs. It certainly would not be a creditable situation to be in, where after a prolonged treatment directed against the genital tract, running the gamut of massage, vaccines and everything else, finally culminating in vesiculotomy,

there were to be no relief; while later on the withdrawal of bad teeth, or removal of infected tonsils would bring about a restoration of the individual's health.

There are two features, which if seriously considered, will make it appear doubtful as to whether the total removal of the seminal vesicles is ever warranted. In the first place we do not stand upon very sure ground in regard to our ability to place all the blame upon the vesicles, for they may be a smaller factor in the trouble than the prostate; it is certain few surgeons would care to attempt the removal of the juvenile prostate for infection. The other point is that by removing the seminal vesicles we are sure to cripple the individual sexually, which in the opinion of the patient is about as serious a matter as the condition we are trying to relieve. A properly performed drainage, however, is a different proposition, for even if the arthritis is not benefited, no harm has been done.

To recapitulate: Epididymotomy represents a decided advance in the treatment of acute epididymitis. Dilatation, massage and irrigation will benefit and keep under control the vast majority of cases where the pathology is present as a prostato-vesiculitis. Irrigation of the vesicle through the vas in properly selected cases is curative. Vaccines have some brilliant successes to their credit and notwithstanding the preponderance of failures, should still find a place in the therapeutics of these disorders. On account of the anatomic and physiologic peculiarities involved, it is evident that those general surgical principles which govern the management of infections in other organs, are not equally applicable here, thus tending to narrow the operative procedures to those having simple drainage as their object.

63 Groton Bldg.

TUBERCULOSIS OF THE SEMINAL VESICLE AND EPIDIDYMIS.*

By H. W. Plaggemeyer, M. D., Detroit, Mich.

It is a generally accepted fact that tuberculous infection in the genito-urinary tract is, as a rule, secondary to a focus of infection elsewhere in the body; in the major portion of cases in the lungs, intestines, and bones. That the disease, however, does occur primarily in the genital tract, has now been demonstrated by a number of observers. In this regard, the cases reported by Crandon, Saxtorph, Krzywicki and others, of prostatic involvement without appreciable tuberculous process in other parts of the body, and of Wulff, Burckhardt and Koll, in which the primary involvement was evidently in the prostate, are of more than passing interest.

Guisy in one hundred and eighty-three cases of urogenital tuberculosis found ten involving the prostate and seminal vesicles alone. Saxtorph in a series of two hundred and five cases, notes nine such occurrences. In his classic contribution to the subject of genito-urinary tuberculosis, Walker found that the disease was *stated* to be primary in the genito-urinary organs with reference to the whole body in fifty-two out of one hundred and seventy-four cases. On the other hand, the same author found, in *experimental* infections, that no matter what mode of infection was used, the lungs were nearly always involved and usually showed the most advanced process.

Regarding the genital tract as a separate entity, the age instance is fairly well distributed, Lyons reporting a primary infection in the seminal vesicles of a child of twenty months, and Barney an epididymal tuberculosis in a baby of eighteen months, and in a man of seventy-three. Generally speaking, one might say that genital tuberculosis is very rare up to the age of four months, the percentage gradually increasing till it reaches its maximum in the third and fourth decade. The comparative infrequency in the pre-pubertal period may doubtless be explained by the latent activity of the genital duct at this time, the relatively scant blood supply reducing the hazard of hematogenous infection. The same explanation may be offered for the fact that, as yet, no epididymis has been reported as tuberculous in cases of undescended testis, possibly due to the fact that all undescended testes are atrophied to an extent, and physiologic activity, though present, is in abeyance.

In early life the disease often affects both sides, but after twelve the majority of cases present a unilateral involvement when first seen. In Barney's

*Read before the American Urological Association, North Central Section, Chicago, November 13th, 1915.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, March, 1916.]

series of one hundred and fifty-three cases of epididymal tuberculosis, thirty-five per cent. were on the right side, and thirty-five per cent. on the left, a bilateral involvement being present in only thirty per cent., as against seventy per cent. unilateral. These figures shatter the idea, long held, that left-sided epididymitis is the rule, and right-sided involvement the exception.

The great mass of evidence presented by different observers, points to the epididymis as the organ most commonly the seat of infection, primary for the genital tract. Cabot says the word genito-urinary tuberculosis is a misnomer; that we should come to recognize that urinary tuberculosis is primary in the kidney and genital tuberculosis is primary in the epididymis. In Walker's second series of two hundred and seventy-nine cases, the kidney was first involved in one hundred and eighty-four, the epididymis in eighty, the prostate in six, and the seminal vesicles in two. Keyes, however, holds the view that "the weight of evidence goes to show that in many, if not all cases, the prostate or vesicle is tuberculous before the epididymis becomes so." His contention is based on the fact that, "with a tuberculous epididymis, the prostate is never normal, and is sometimes manifestly tuberculous to rectal touch. On the other hand, with a tuberculous prostate or vesicle, the epididymis is not necessarily involved; also involvement of the prostate or vesicles, or both, precedes involvement of the second epididymis.

One cannot deny the verity of these conditions from a clinical standpoint. But there is also much authentic evidence to the effect that the epididymis is, in most cases, affected first.

Watson in a series of twelve cases, found on careful examination that the tuberculous infection began in the epididymis of one side. In four of these, there was an extension to the vas and the vesicle of the same side, without any evidence that the prostate had been involved. In none of the other eight did the process advance beyond the epididymis or testis, these patients being watched for periods varying from eight to twenty-three years. The same author claims to have seen only three cases in which the disease was present in the prostate, as the only part affected below the bladder. In these the kidney was thought to be affected in each instance.

This would seem to offer evidence that the disease may be manifest at either end of the tract, with an interval of time between its manifestation at either point, the kidney or the epididymis. Also it is clearly shown that an epididymal infection may follow, chronologically at least, a renal infection of the same side without implicating the prostate or seminal vesicles, and yet again, that the process may begin in the epididymis and remain localized there, without ever involving any other part of the tract.

The genital tract, in its development, bears a striking analogy to the urinary tract. The epididymis is a remnant of the mesonephros, and, in its rudimentary excretory capacity, it might be expected to pick up micro-organisms from the circulation in a manner entirely similar to that of the kidney. Theoretically, one might then look to the epididymis as the primary seat of invasion for the genital tract, as the kidney is the recognized primal site in the via urinaria. A striking example of this developmental relationship is seen in the case cited by Frisch and Zuckerkandl, in which a patient had a tuberculous kidney removed. The mucous membrane of the ureter and the trigone of the bladder were found to be implicated in the process also. Several months later, the epididymis became tuberculous without either the prostate or seminal vesicles being involved.

By the same token, the prostatic anlage and its early functions, being of such different nature from that of the epididymis, it is easy to see why this gland and its adnexa, the vesicles, might be less frequently the seat of primary infection. And continuing the adverse comparison still further, and by the same logic, one might be led to suspect a priori, that, from their wide difference in genesis, as well as by their relative remoteness from direct urinary infection, the vesicles would be less open to primary infection than the prostate, and this is fairly proved to be the case by the best obtainable statistics in a proportion of one to three.

Much experimental evidence has been put forth to prove the capacity of normal vesicles to secrete tubercle bacilli. Landouzy and Martin found in guinea-pigs, that if the lumenar contents of the vesicles were taken from tuberculous animals in which the vesicles were not involved, the material produced tuberculosis when injected into other animals. Sirena and Pernice also found that they could produce tuberculosis in the peritoneal cavity of a dog, by injecting material gotten from the vesicles of individuals dead of tuberculosis, but having no involvement of the vesicles. Maffuci injected rabbits with large doses of tubercle bacilli. In twenty-six days he discovered the bacilli on the mucosa of the otherwise normal vesicles. Nakarai, in a human subject, discovered tubercle bacilli in normal vesicles. Jaechk, Gaertner, Cavagnis, Albrecht, and Kochel all conclude that these organs secrete the bacilli more often than any other part of the genital tract.

In the face of this evidence one might still assume that the examination of these organs has not been exhaustive enough to warrant the belief in this healthful secretory faculty as an established fact, and it is extremely probable from the experimental work of Walker, that all vesicles which secrete tubercle bacilli have a tuberculous focus somewhere in the submucous tissues, which is the first site of election. Whether the normal vesicle

can harbor and then cast off the tubercle bacillus with impunity, or whether its histone producing faculty has a deleterious influence on its capacity as host to that organism, through its agglutinating power on the tubercle bacillus, as in some of the lower animals can, on the face of the evidence offered, be viewed at present, only as an unsolved problem. Suffice it to say, however, that, though the seminal vesicle infection is present as a secondary involvement in about sixty per cent. of cases of tuberculosis of the genital duct, its primary involvement is in all probability an extreme rarity, and from the standpoint of its primarity alone, is not to be viewed essentially as a surgical factor. As an academic fact, the developmental analogy of the seminal vesicles and the urinary bladder is striking, and our minds have long since been made up as to method of attack in tuberculous disease of the latter. One is quick to leave the bladder and to attack the kidney when it is definitely known that the latter is involved, and generally speaking, one might do worse than follow the same rule in the case of the vesicles and epididymis.

Approaching the field of controversy as to local avenues of extension in the genital duct per se, one is faced with much argument, and much experimental work, purporting to prove extension via the vas in each direction.

The work of Baumgarten and Kraemer would make it appear that from a posterior urethral infection, the process is never propagated through the vasa deferentia to the epididymis, while infection of the vas or seminal *vesicles* does extend to the urethra, in fact, that an advance of the process never takes place against the direction of the seminal current. In a large number of cases of experimental tuberculosis of the prostate and vesicles, they did not observe a single animal in which the disease had extended down the vas. They claim that the constant stream in the vas from below upwards prevents the non-motile tubercle from going down, that the ciliated epithelium tends also to prevent the downward passage of the organisms, and that it requires too many days for them to multiply in the normal secretion. Directly opposed to this are the experiments of Paladino-Blandini, which indicate that the tuberculous, as well as other microorganisms placed just within the external urethral meatus *do* infect the deeper parts of the tract by direct extension backward along the urethra and directly against the current. They do not, however, prove extension further, through the vas.

It has long been a moot clinical question as to whether local infection of the glans takes place through coitus. The weight of authority is against this, yet Frank, Schuchardt, Tedenat, and Prat-Lacene have all recorded very suspicious cases, and the possibility must be granted. Garin cites the case of a man with ulceration of the glans, followed by tuberculosis of the prostate, vesicles, and

epididymis, and Julius Frank, the case of a boy fourteen years old, with a tuberculous ulcer of the glans followed by infection of the epididymis. Several cases have been reported, two in the knowledge of the writer, where infection of the prepuce with extension backward has taken place from rabbis, known to be tuberculous, in performing the orthodox rite of circumcision. Neither of these authors, however, proves that the deep infection was not a *hematogenous* one.

Teutschlander argues as follows in favor of the descension theory.

(1) Ciliated epithelium does exist in the epididymis but not in the vas.

(2) Primary tuberculosis of the vesicles is often overlooked, for the reason that it is not searched for in the early stage.

(3) One should not draw conclusions from rabbits, for the reason that their vesicles and prostates differ so markedly from those in man.

(4) Reports several cases in the human in which the disease seemed certainly to have extended from the vesicles partly down the vas.

Stonham had a patient in whom the left seminal vesicle was very much enlarged. When the left vas was opened the mucosa beginning with the prostate and extending for some distance was studded with small tubercles and ulcerations. The disease ended abruptly and beyond this point the vas was sound and the epididymis was normal. This seems to be an instance of an undoubted extension down the tube.

Oppenheim and Low found that by stimulating the hypo-gastric nerve, they could produce a reversed peristalsis in the vas. They also found that by stimulation of the verumontanum, they could bring about a similar result. This they were led to believe held true for men as well as for rabbits and guinea-pigs. They therefore believe, that, during an infection of the posterior urethra, an irritation may produce a reverse peristalsis and set up an infection of the epididymis, by direct descension.

Walker, in a large series of rabbits with tuberculosis of the prostate and vesicles, noted one animal only, in which he thought the infection might possibly have passed down the cord. In two animals in which he placed pieces of tuberculous lung in the urethra, there was widespread involvement of the vas and epididymis, and careful examination of the specimens made it appear that the extension was a direct one down the vas.

In another series of eleven animals, in which tuberculous cotton was inserted in the seminal vesicles, two had involvements of the epididymis, which he took for evidence of downward extension. Of thirty animals, in which the injections were made into the posterior wall of the bladder, two showed implication of the vasa. In one, the epididymis was also affected. In the other, the *whole right vas and part of the globus minor were affected;*

on the other side the vas was uniformly diseased. The above instances by a most careful observer, point very strongly to the conclusion that the disease *may* descend.

However, the same author noted in his experiments, the great frequency and ease with which the disease spreads from below upwards, and the *relative* infrequency and difficulty with which infection descends.

As to the method by which the disease passes from the epididymis upwards, it is asserted by Baumgarten that the bacilli are carried upward by the stream of the vas. To this theory the following objections may be raised:

(1) Tuberculosis in many instances affects the vas to such a degree that the lumen in the lower part is entirely occluded and often obliterated before the upper part is involved.

(2) When the vas is ligatured in animals, the infection is delayed, but later the disease passes on above.

(3) Again, if the force of the vas stream were strong enough, there would be implantation generally and simultaneously along the epithelium lining the lumen.

It is possible that ascension by the subepithelial lymphatics would explain this.

Baumgarten and his pupils are probably right in the main, but that they go too far in asserting that descending infection never takes place, the work of Walker would show.

How else could one explain a tuberculosis of the vesicles or prostate and a continuous involvement of the adjoining vas, with a free epididymis and testis. If it were not direct infection, it must be through the lymphatics or the blood stream, in which case, one would certainly expect involvement of the epididymis or testicle, or both.

Ascension certainly seems to be the rule; descension the exception.

All that can be actually postulated as to the peripatetic activity of the tubercle bacillus is that it enters, in the great majority of cases, by way of the kidney into the urinary tract, and descends by preference, and mounts from below with reluctance, if at all, and then most probably by the lymphatics. The large proportion of cases in which the epididymis or testicle when involved, appear clinically to be the first seat of tuberculous lesion in the genito-urinary tract, and the relatively greater proportion for the genital tract alone, as well as the frequency with which the disease apparently remains limited to these structures, points strongly to the blood current, or the lymph tract, as the usual path of approach. This evidence is augmented by the large number of recorded cases in which the foci were sub-epithelial or intertubular. A further verification of this premise is found in the frequency with which the globus major is attacked in unilateral cases, or in which, if a wider area be

involved, the upper portion of the epididymis is evidently the site of the first involvement, with or without involvement of the upper pole of the testis. This condition when present without complication, is practically always primary, and is considered by many, a diagnostic point, though Koll has recently shown that in other infections, such as colon, staphylococcus, streptococcus, etc., the clinical manifestation may be so similar, that only careful study of the removed epididymis will tell the story.

To further confuse the time-honored clinical picture, Walker's injection of the aorta with tubercle bacilli in twenty-eight animals gave the following results: Eight showed tuberculous epididymitis; five on the left, three on the right; in four the globus minor was affected; in two the globus major. This would point to the globus minor as the more common locus of hematogenous infection, and is at variance with the clinical observations of others.

The involvement of the second side usually occurs as in gonococcal infection, in the globus minor, most often with fulminating symptoms, suggesting mixed infection. It would seem then, that in many cases, when the second side becomes involved, the disease has traveled up and involved the prostate and seminal vesicles, and then gone *down* the vas, just as in Neisserian infection. This is clinical evidence in favor of the descension theory, by way of the lumen of the vas.

To recapitulate; massive infection *can* pass in either direction in the vas by continuity, but direct conduction by the lumen is rare, and if accomplished is negative in its effect on normal epithelium. Descending infection from all parts to the genital tract is in most instances via the blood stream, and ascending infection to other parts of the genital tract by way of the lymphatics, an infected vesicle on the opposite side to the primarily infected epididymis being explained by the decussation of the lymph paths at the base of the bladder.

Treatment.—One must frankly confess at the outset, that there is no subject in the range of surgical diseases of the genito-urinary tract about which there is so much diversity of opinion among competent observers as in tuberculosis of the seminal vesicles and epididymis. The expressions of opinion gotten through personal correspondence with the leading clinics and sanatoriums of the country are conflicting, but the composite result may be summed up briefly as follows:—

When tuberculosis involves the epididymis alone, epididymectomy should be performed; this, in face of the argument advanced by some that operative interference may cause a flare up on the opposite side. The march is rapid without operation. In the last series reported from the Massachusetts General Hospital, of thirty-three unoperated epididymes eighteen or fifty-five per cent. became involved on the opposite side within a year after invasion of the first side.

If both epididymes are involved, double epididymectomy is indicated, for this operation does not impair masculinity and sterility has in most cases already taken place, even before the second side was involved.

Knowing that invasion of the second testicle is likely in either case, and recognizing the great value of the testicular hormone, it is questionable whether orchidectomy is ever indicated. Some of the reported results of subsidence of activity in this gland following epididymectomy are little short of marvelous, and when it is mechanically possible to remove the epididymis and still leave the testicle some blood supply, it is safe to hope that, except in rare instances, the latter can be saved. In none of Barney's cases did the patient return for subsequent orchidectomy and Keyes reports one case only, and that as a rarity. When both epididymis and testicle are involved, it is better to incise and drain, if pus is present. In regard to the removal of the vas, if the latter is involved massively in its entire extent, the high operation of Cabot is the procedure of choice, but the advisability of this method as a routine procedure is open to question. It is doubtful if the opening of the tissues will in any way benefit the further development of a tuberculous peritonitis, if such a condition has already supervened.

In the experience of many active workers in this field, the removal of the epididymis and contiguous portion of the vas has had a most signal effect on the process in the vesicles; the infection has receded, and the vesicles have become fibrous. Recently Young has been advocating vesiculectomy under certain conditions. The operation is a difficult one, and two of the largest clinics of the country have each noted four cases of impotence following the operation. These reports are as yet unpublished. Still in the type of cases selected by Young, where the disease is limited entirely to these glands and does not involve the prostate, vesiculectomy is unquestionably a splendid operation, because it removes entirely the focus of disease. On the other hand, if the prostate be involved, vesiculectomy should not be performed, as the chance of persistent perineal fistula is too great. This may appear as too conservative to those in favor of radical removal of all caseous foci, but considering the type of disease with which we are dealing, it is probably better to err on the side of caution, especially where the lower duct is first involved. For as has been noted, the removal of the first part involved in a large number of instances, causes recession of the process in the higher parts which are so frequently the victims of a secondary invasion.

The prognosis in primary tuberculosis of the genitals in children is usually good. In fact there seems to be a limitation of the tuberculous process in all organs of children, the one notable exception, of course, being the meninges. This tendency to lo-

calization in the pre-pubertal period in contra-distinction to the wider involvement usually encountered in later periods of life is a strong argument for radical operation with a view to permanent cure.

Too much emphasis cannot be laid on the value of hygienic and climatic treatment, both pre-operative and post-operative, especially the use of heliotherapy as advocated by Lawrason Brown, for it must be kept in mind that in the larger percentage of cases we are dealing with more or less generalized tuberculosis in other parts of the body. The writer is in favor of Corbus' idea of active immunization before operation by producing, in maximal amounts, antibodies to all constituents of the tubercle bacillus, it being understood that the patient has no closed foci from which absorption is taking place and is not already supplied with an excessive amount of antigen.

Ultimate Results.—Of the one hundred and thirteen cases followed at the Massachusetts General Hospital, twenty-seven per cent. have died of some form of tuberculosis. Of these deaths, fourteen per cent. occurred within one month, thirty-two per cent. within six months and fifty per cent. within one year after operation. During the first six years, eighty-five per cent. died, while between the ninth and eleventh years 10.7 per cent. succumbed. Miliary, renal and lung involvement are, in order, the final types of the disease. The conclusion reached in this report is that until at least ten years have elapsed after operation, no patient can be said to be cured of tuberculosis.

In conclusion, genital tuberculosis in the male is a very grave affection, and except in the case of children, where the local process often remains the only tuberculous focus in the body, operation is only to be looked on as one of the means to an end, and conservative effort is to be looked upon with favor. The survival of the patient, primary foci being removed, depends largely on the ability of his body to immunize itself to the disease, to the development of which immunity our chief efforts should be directed.

BIBLIOGRAPHY

Anshutz, W.: Tuberculosis of the Epididymis. *Medizinische Klinik*, Jan. 4, 1914, Vol. X (Abstr.).

Barney, J. Delinger: Tubercular Epididymitis; End Results of 71 Cases. *Boston Medical and Surgical Jour.*, Vol. CLXVI, Noll. pp. 409-414, March 14, 1912.

Barney, J. Delinger: Observations on the Seminal Vesicles. *Interstate Medical Jour.*, Vol. XXI, No. 11, 1914.

Barney, J. Delinger: The Value of the Guinea-Pig Test in Genito-Urinary Tuberculosis. *Boston Medical and Surgical Jour.*, Vol. CLXIV, No. 26, pp. 917-919, June, 29, 1911.

Barney, J. Delinger: Recent Studies in the Pathology of the Seminal Vesicles. *Boston Medical and Surgical Jour.*, Vol. CLXXI, No. 2, pp. 59-62, July, 9, 1914.

Barney, J. Delinger: The Ultimate Results of Genital Tuberculosis in the Male. Transactions A. M. A. Genito-Urinary Section. 1914.

Barney, J. Delinger: Tuberculosis of the Epididymis and Prostate. *Boston Medical and Surgical Jour.*, Vol. CLXVII, No. 25, pp. 923-927, June 19, 1913.

Barney, J. Delinger: Tubercular Epididymitis; An Analysis of 153 Cases. *American Jour. of Urology*, December, 1911.

Baumgarten, P. and Kraemer, C.: Experimentelle Studien über Histogenese und Ausbreitung der Urogenital Tuberculose. *Arb. a. d. Geb. d. Path. Anat. Inst. zw Tubingen*, 1902-3, IV, 173-198.

Burckhardt: *Muench. med.Woch.*, 1911, p. 1750.

Corbus, B. C.: Immunization in Genito-Urinary Tuberculosis: A Procedure of Immunization Before Operation. *Transactions American Urological Assoc.* Philadelphia, 1914.

Crandon, L. R. G.: Tuberculosis of the Prostate. *Boston M. and S. J.*, 1902, CXLVII, 17-19.

Frank, J.: Uber Tuberculose des Penis. *Inaug. Diss. Strassburg*, 1897.

Fuller, Eugene: Surgery of the Seminal Vesicles. *Medical Record.*, Jan. 23, 1915.

Fuller, Eugene: Seminal Vesiculotomy: Its Purpose and Accomplishments. *Medical Record*, New York, Oct. 30, 1909.

Garin, J.: Observation de Tuberculose des organes genito-urinaires. *Mem. et compt-rend. Soc. d. sc. Med. de Lyons*, 1877, XVI, pt. 2, 36-40.

Goodman, A. L.: Tuberculosis of the Testicle. *Medical Record*, Jan. 24, 1914, Vol. 85.

Guisy, B.: Tuberculose prostatovesiculaire. *Revue internat. de la tuberc.*, 1906, X, 81-87.

Hesse, F. A.: Tuberculose der Prostate. *Berliner klin. Wochenschrift*, June 22, 1914, Vol. 51.

Keyes, E. L., Jr.: Diseases of the Genito-Urinary Organs. Text-book, pp. 475-478.

Keyes, E. L., Jr.: Tuberculosis of the Testicle: Observations Upon 100 Patients. *Annals Surg.*, Phila., 1907, XIV, 918.

Koll, I. S.: Primary Tuberculosis of the Prostate Gland. *Annals of Surgery*, Vol. LXII, No. 4, October, 1915, p. 473.

Kraske, P.: Ueber einen Fall von tuberkuloser Erkrankungen der Glans penis, etc. *Beitr. z. path. Anat. u. z. allg. Path.*, Jena, 1891, X, 204-210.

Krzywicki, C. V.: 29 Fälle von Urogenital-tuberculose darunter ein Fall von Tuberculose beider Ovarien. *Zeigler's Beitrage*, 1888, III, 297.

Landouzy, L.: Et Martin H. Faits cliniques et experimentaux pour servir a l'histoire de l'heridite de la tuberculose. *Revue de med.*, 1883, III, 1014, 1032.

Lewis, Bransford: Urogenital Tuberculosis. *Buffalo Medical Jour.*, July, 1909, pp. 643-56.

Lindmann: Ein Beitrag zur Frage von der Contagiositat der Tuberculose. *Deutsch. med. Wchnschr.*, 1883, IX, 442.

Lyons, O.: *A. M. A. Trans.*, 1914.

Marinisco, R.: Epididymectomy for Tuberculosis.

Martin, A. M.: Tuberculosis Disease of Epididymis, Vas, and Seminal Vesicles; Removal in One Piece. *Northumberland and Durham, M. J.*, New-Castle-Upon-Tyne, 1903, XI, 169-173.

Nakarai, S.: Experimentelle Untersuchungen uber das Vorkommen von Tuberkelbazillen in den gesunden Genitalorganen von Phthisikin. *Beiträge z. path. Anat. v. z. allg. Path.*, 1898, XXIV, 327-342.

Oppenheim, M. w Low O.: Klinische und experimentalle Studien zur Pathogenese der gonorrhoischen Epididymitis. *Virchow's Archiv.*, 1905, CLXXXII.

Paladino-Blandini: *Guyon's Annals*, 1900, XVIII, 1009.

Saxtorph, S.: Valeur de l'intervention chirurgicale dans la tuberculose vesicle. *Comp. rend. 13 congr. internat. de. med.*, Paris, 1900, 97.

Simmonds, J.: Tuberculosis of the Male Genital System. *Beiträge z. Klinik d. Tuberculose.* November, 1914, Vol. XXXIII (Abstr.).

Stonham, C.: Tubercular Disease of the Left Vesicula Seminalis and Left Half of the Prostate with Exten-

sion into the Left Vas Deferens. *Trans. Path. Soc.*, London, 1887-8. XXXIX, 197.

Teutschlander, O. R.: Wie breitet sich die genital-tuberculose aus? (Ascension und Descension.) *Beitr. z. klin. d. tuberk.*, 1906, Vol. V, 83-182.

Thomas, B. A. and Pancoast, H. K.: Observations on the Pathology, Diagnosis and Treatment of Seminal Vesiculitis. *Annals of Surgery*, September, 1914, Vol. XXXVII, No. 5, pp. 313-318.

Uchimura, M.: Tuberculosis Disease of the Genito-Urinary Organs, as Seen on Post-Mortem Examination, *Sei-i-Kwai Medical Jour.*, Vol. XXXIII, May 10. (Abstr.)

Voelcker, F.: Excision Tuberculoser Samenblasen mit temporarer Verlagerung des Rectum. *Beitr. z. klin. Chir.*, Tubing, 1911, LXXII, 722-740.

Walker, George: The Nature of the Secretion of the Vesiculae Seminales and of an Adjacent Glandular Structure in the Rat and Guinea-Pig with Especial Reference to the Occurrence of Histone in the Former. *Johns Hopkins' Hospital Bulletin*, Vol. XXI, No. 231, June, 1910.

Walker, George: A Special Function Discovered in a Glandular Structure Hitherto Supposed to Form a Part of the Prostate Gland in Rats and Guinea-Pigs. *Ibid.*, Vol. XXI, No. 231, June, 1910.

Walker, George: The Effect on Breeding of the Removal of the Prostate Gland or of the Vesiculae Seminales or of Both: Together with Observations on the Condition of the Testes After Such Operations on White Rats. *Johns Hospins' Hospital Reports*, Vol. XVI.

Walker, George: Studies in the Experimental Production of Tuberculosis in the Genito-Urinary Organs. *Johns Hopkins' Hospital Reports*, Vol. XVI.

Watson and Cunningham: Genito-Urinary Diseases. Vol. II, p. 414.

Weisz, Franz: Diseases of the Seminal Vesicles. UROL. AND CUTANEOUS REVIEW, TECHNICAL SUPPLEMENT, p. 243, July, 1914.

Wildbolz, H.: Tuberculosis of the Urinary Organs. UROL. AND CUTANEOUS REVIEW, TECHNICAL SUPPLEMENT, p. 128, April, 1915.

Wulff: *Deutsch. med. Woch.*, 1909, p. 1332.

TRANSACTIONS

Joint Meeting of the American Urological Association (North Central Section) With the Chicago Urological Society.

NOVEMBER 12 AND 13, 1915.

The President of the Chicago Urological Society, Dr. Herman L. Kretschmer, in the chair.

"Cloacal Morphology and Its Relation to Genito-Urinary Diseases," by Dr. B. M. Ricketts, Cincinnati, Ohio. (No discussion.)

"Phylacogens in Urology," by Dr. F. W. Robbins, Detroit, Mich. (March issue this journal.)

Discussion

Dr. Charles M. Harpster, Toledo, Ohio: Mr. President: I believe Dr. Robbins very nicely summed up the situation. I have found several cases at the very inception of an acute arthritis, following an acute urethritis, in which the action of phylacogens or the vaccines has been very remarkable. Just as an illustration: A young man has a discharge for forty-eight hours, with swelling beginning immediately in the wrist, accompanied by intense, violent pain and swelling of hands and forearms. This man was given two hundred million killed gonococci at once. I believe in all these cases I have found this, that if you give a heroic dose at the outset you will oftentimes get results much better than when you give a smaller dose and increase the dosage. In cases of acute arthritis, with enlargement of the prostate gland, where you can milk pus out of the vesicles in large amount, the immediate inoculation of those patients with the phylacogens has been followed in my hands with excellent results. In the cases of chronic trouble—that is, chronic prostatitis, seminal vesiculitis, nodules on the epididymis and testicles, and so forth—I have not had much success with vaccine or phylacogen. I believe the keynote of the situation is this, that the acuter the case, the more violent the symptoms, the earlier and more heroic the injection, the better the results obtained.

Dr. Franklin B. Wright, Minneapolis: The object in giving vaccines or dead bacteria is to stimulate the production of antibodies in the blood, thereby bringing about the natural end of the disease. The question of how much we shall give without over-stimulating is the one which should decide the dosage and frequency with which we give vaccines or phylacogens. It has been my experience that small doses have been of little value, and when I give vaccines at all I usually begin with four hundred million, and after the first dose I do not hesitate to give a billion, providing the patient has no depression from the first injection. I don't consider that one or two million is anything.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, March, 1916.]

I would not give it to one of my patients. I give large doses or none at all.

Dr. F. C. Herrick, Cleveland, Ohio: I wonder if the last speakers have confused phylacogens with vaccines. I thought they used the two terms almost synonymously.

Dr. Wright: I spoke of vaccines.

Dr. Herrick: My experience coincides with his as regards vaccines, but as regards phylacogens, I have had practically no beneficial results, except in a very few acute cases. I have used phylacogens also and more widely in other infections, in the Out-Patient Department, and beyond making the patient very sick, I have seen no results.

Dr. Franklin B. Wright, Minneapolis: I spoke entirely of the action of vaccines. The difference between the two is whether you give the exogenous or endogenous toxins which the bacteria produce in their growth. Apart from that, they are both given on the same principle, namely, that of stimulating antibodies in the blood. The phylacogen gives the exogenous toxin; the vaccine gives the endogenous, so that the same rule should apply to both.

Dr. James A. Gardner, Buffalo, N. Y.: I would like to ask Dr. Robbins if, in these cases which he felt were cured, he subsequently used any complement fixation test, or whether, as we find in many old vesicular conditions, they quieted down and would light up possibly a month or two or three later. During that period we always find a two or three plus complement fixation.

Dr. Wm. E. McCollom, Brooklyn, N. Y.: Did the doctor use any other treatment except the phylacogens?

Dr. H. L. Kretschmer, Chicago: I would like to ask Dr. Robbins, in closing, to tell us the extent of the reactions he had in administering phylacogens intravenously. The brief report made by me, to which he referred, was published several years ago. Subsequent to that publication several of the cases treated with phylacogens had severe reactions. In one case particularly the hemoglobin went down to fifty per cent. In several cases the patients developed a marked anemia. I would like to know whether or not Dr. Robbins' cases had the same degree of anemia and marked reaction following the intravenous use of phylacogens.

Just a few words in regard to the treatment of these so-called cases of gonorrheal rheumatism with phylacogens and vaccines. In some of the cases we did not obtain the desired results. We usually used routine local treatment plus vaccines and phylacogens, and yet the patients did not have the results from the treatment that they should have. I was just wondering how many of these cases had other foci of infection. Whether their joints were all due to the infection in the prostate or vesicles or deep urethra; whether they did not have other foci of infection, such as the tonsil. I think, in all of

these cases, that we should go into a differential diagnosis to more carefully eliminate other foci of infection.

Dr. A. C. Stokes, Omaha, Neb.: I would like to emphasize the point made by our chairman regarding reaction. In Omaha we have used phylacogens in a number of cases, I should say ten or fifteen times in the hospital, and I cannot say that in any one particular case we saw any good at all from them, and I think in most of the cases we all agreed that there was more or less harm done by them, if we could judge by those cases. Of course, these cases were almost all chronic articular cases of gonorrheal origin.

Dr. V. D. Lespinasse, Chicago: Lately I have not used phylacogens at all, but in the early days, when they first came out, I used them on a series of arthritic cases, and I found that if we gave a large dose at that time (from six to ten c.c.), intramuscularly or subcutaneously, the beneficial results, if obtained at all, were obtained right away. The patients had considerable reaction, chills, fever and so forth. My experience only included nine cases. Half of them were cured in three or four days, the joint pains disappearing, and they were able to get up and walk around. Those that were not benefited immediately were given subsequent doses. So that I feel that if you obtain any beneficial results, you will perceive them right away. Some did not obtain improvement with as high as twelve injections, given once or twice a week. In other types of cases, epididymitis, prostatitis, and so forth, I have had no experience.

Dr. Theo. H. Smith, Detroit, Mich.: My experience with phylacogens is very limited. I, like many others, tried it when first presented. Several doses were given to me for experimental use. We tried it, of course, on clinic patients. Our experience was unsatisfactory, with the exception of one patient, and the interne, in giving it, gave by mistake instead of one-half c.c. intravenously, for the first dose, two c.c. intravenously, and the patient almost died that night. The next day, however, his arthritis was gone, either from fright or fear of getting another dose. (Laughter.) At any rate, he was very nimble and active after the reaction. Since then we have not used it.

Dr. E. G. Mark, Kansas City, Mo.: I would like to ask Dr. Robbins if it is not so that we get a complement fixation test after simple vaccines, whether the patient ever had gonorrhea or not? Would it not be equally so in the use of phylacogens?

Dr. W. T. Elam, St. Joseph, Mo.: Sometimes I thought I was getting results, but I never could tell whether they were due to phylacogens, or not. I was always reminded, when I used phylacogens, of an old doctor I used to know. He dished out his own medicines, and when he had more than necessary he always put it into a certain

bottle. When he came to a case where he did not know what the trouble was he used that medicine. (Laughter.) As a matter of fact, many of them got well in spite of the fact that he did not know just what the medicine contained, and that he gave it for conditions which he did not recognize.

The truth of the matter is that in genito-urinary disease, like other diseases, many of our patients will get well, whether we use phylacogens or not. Ofttimes another doctor is called in, and before he has time to change the treatment the patient improves and he gets credit for the improvement. This also occurs where phylacogens has been used and the phylacogens gets the credit.

It seems to me that there is probably more scientific reason for using vaccines than using phylacogens, providing you know exactly the germ you have, and with an autogenous vaccine there is really some reason for its use.

As for phylacogens, I never could see that I got any results from them.

Dr. F. W. Robbins, Detroit, Mich. (closing the discussion): If anybody knows me very well he knows that one of my faults is conservatism. I was visited by the purveyor of vaccines and phylacogens over and over again, until so insistent was he that I did not know whether he was a fool or I. I looked over his great list of case reports, one after another, but came across no name which was familiar to me; these reports came from every little spot and town the country over. I said that those reports meant and proved nothing to me, because anybody can get reports on anything. This purveyor has not been in my office for a year and a half. I do not want to see him again. Meanwhile, I had some little correspondence and talk with the heads of the Experimental Department, and I felt that Parke, Davis and Company would injure themselves before the profession, particularly by the way that phylacogens was put on the market. President Ryan is a very fine gentleman, but it came to my mind that Ryan at one time said that he would trust the future success of Parke, Davis and Company to the outcome of the use of phylacogens, and upon its merits. All that sort of thing got my goat, as it were, and finally I said to Dr. Larned that if they would give us a few packages I was quite sure that some of my confreres would be glad to work with me and see if it was of value in urology.

My report is made as a preliminary report on the observations of between fifty and sixty cases. I think, rather than use phylacogens in large doses, and getting the reactions that have been induced by some physicians, I would rather leave phylacogens out of any armamentarium. I think the largest dose I have ever given was six c.c. The very fact that Dr. Smith had a case in which he gave 10 c.c. for several days, with marked improvement, shows me that either he had pretty good control

over the patient or that the patient did get improvement that was worth the reaction that he got. So, Mr. Chairman, in reply to your question, I have given from one-half to six c.c., and have not gotten any severe reaction, and have tried to limit the reaction to a temperature of 101°. In one case it went a little higher.

In connection with Dr. Gardner's suggestion, I think my paper will practically bear out this idea that phylacogens has no value in producing a negative complement fixation test. If it did do that, it ought to cure and help acute prostatitis. I am very doubtful whether it helped cases of acute prostatitis, but I have seen a few cases where the prostate was very sensitive and large—those cases in which you cannot use any other treatment and are practically put on the rest treatment. In those cases I have given phylacogens, and I think in some with beneficial results, although I am not at all sure about it, and will be glad to carry out further observation, if enough interest is displayed in it to make it worth while.

However, going into the thing with absolutely unbiased mind—perhaps more biased against phylacogen than otherwise—I feel just this way, that if a man comes to me with an acute gonorrheal arthritis, a private patient, I am not justified in letting him go without the benefit that I seem to have gotten in other cases with phylacogens.

In epididymitis, I have been more and more impressed, since using the phylacogens to the exclusion of all other methods of treatment, that epididymitis in a great majority of cases will do just as well under homoeopathy as under the best treatment we have ever used. But I do think that in a certain number of cases phylacogens and rest together—which is the more beneficial I do not know—will cheat us out of a good many operations.

* * * * * * *

Dr. Ravogli, of Cincinnati, Ohio, read a paper on "Syphilis of the Prostate." (March issue this journal).

Discussion.

Dr. Franklin B. Wright, Minneapolis: Mr. Chairman: Two years ago I had the pleasure of reporting to the Chicago Urological Association a case of syphilis of the prostate, which corresponds with the class of late syphilis which Dr. Ravogli speaks of. This patient had a history of seven months' cystitis; had been watched and treated for about three months in bed. Suprapubic drainage had been performed, and when he came to me there was a fistula of five months' standing. He had ten ounces of residual urine in the bladder in spite of the existence of the fistula. The bladder was washed out and cystoscopic examination made through the urethra, which showed simply a trabeculated bladder. The posterior urethra was excessively sensitive. Rectal examination at that time

showed a slightly enlarged prostate, uneven on the surface, and nodular. So far as elesticity was concerned, it was firmer than normal, but still did not give sensation of being hard. It was excessively tender to the touch. I made a Wassermann, which was positive. He gave a history of having had an insignificant sore on the penis twenty years before. After six weeks the residual urine was about three ounces, and he went back home. A year afterwards he was fairly well. His family physician laughed at him, and said I was fooling him. It took three years longer to develop tabes, and last winter I saw him, after the diagnosis had been confirmed by Dr. Thomas, at Rochester, and he now has a well-marked tabes.

Dr. B. C. Corbus, Chicago: The recognition of syphilis is divided into three given periods, you might say. First, a period previous to 1876; second, a period from 1876 to 1900. Previous to 1876 syphilis was diagnosed by the pathologist at the post-mortem table. From then to 1900 syphilis was diagnosed by giving specific treatment first. If the treatment fitted the disease, the patient had syphilis. With the advent of the cystoscope, did it first become possible to diagnose syphilis of the urinary tract, and, by the way, our most estimable member, Dr. Granville MacGowan, was one of the first to diagnose syphilis with the cystoscope.

An interesting thing concerning secondary syphilis is the secondary syphilide, which is characterized by discharge. It is possible and probable that the way of infection is by this method: The urethra, teeming with spirochetes, during ejaculation carries an infection to the female. An interesting case is cited of a woman who had a husband who had syphilis, and, fearing to infect her, he ejaculated on the pubes, and at the site she developed a large chancre. Another interesting case is of a German soldier who wanted to escape military service. He injected into his own bladder some urine of a sick person, and later on developed severe cystitis and secondary syphilis.

The diagnosis of syphilis by the cystoscope is the beginning of the modern diagnosis of syphilis. Syphilis can attack the bladder and prostate, as Dr. Ravogli said, during the period of secondary localization. The spirochete localizes in every pore of the body. I have myself observed in a Japanese man the typical mucous placques on the bladder mucosa, and also a mild grade of cystitis.

Syphilis in the tertiary form simulates very closely papilloma. Syphilis of the prostate has been reported only very infrequently. I was very much interested in Dr. Wright's case. I can find in the literature scarcely six cases of syphilitic prostatitis.

Syphilis of the ureter exists, and it is in my cases of secondary syphilis, and it would be a good idea in some of our cases, where we can, to make the differential diagnosis.

A most interesting clinical symptom in syphilis

is the acute parenchymatous syphilitic nephritis. The kidney is involved in secondary and tertiary syphilis. Gumma of the kidney only appears at autopsy. A parenchymatous syphilitic nephritis is a recognizable condition, and calls for prompt treatment.

With the advent of our Wassermann; with the advent of the spirochete and modern cystoscope, it is not hard to diagnose these lesions in the bladder.

In regard to spinal syphilis, the secondary bladder findings in spinal syphilis, we are all coming to know that a large percentage of syphilis with negative Wassermanns on the blood stream show up sixty-five and seventy per cent. of tabes, after negative blood Wassermanns. If we regard this test as final, we will get into trouble later on. Every case that comes for diagnosis of syphilis is not complete until a spinal fluid examination has been made.

DR. G. J. THOMAS, Rochester, Minn.: In discussing syphilis of the genito-urinary tract, I might cite a case of intermittent hemoglobinuria in a man who gave a history of lues and in whom the Wassermann test was positive. The complaint was, briefly, that of the passage of what the patient thought to be blood, with slight rise of temperature and chills after exposure to cold. The so-called blood came from both kidneys, but proved to be nothing more than hemoglobin. Antisyphilitic treatment was instituted and after a period of six months, during which time twelve or fifteen injections of salvarsan were given, his symptoms, including hemoglobinuria, disappeared.

In the Urological Department of the Mayo Clinic, the diagnosis of cord lesion is frequently made by means of the cystoscope when the other manifestations have not been apparent in the general clinical examination. In some cases in which both the spinal fluid and blood Wassermanns were negative we have been able to reconstruct a diagnosis by referring the patient back to the physician and urging him to further efforts because cystoscopy revealed a characteristic relaxation of the posterior urethra and characteristic trabeculation of the bladder.

DR. H. J. SCHERCK, St. Louis, Mo.: It has occurred to me after hearing the paper of Dr. Ravogli that our pathologists have overlooked in some cases the microscopic diagnosis of syphilitic disease of the prostate gland, or that this condition is not as frequent as we are led to believe from listening to the paper just read. It has been our custom in all of the hospitals with which I am connected to send the specimen removed to our pathological departments as a routine measure, our object being to discover if possible, any evidence of malignant change in the gland. So far as malignancy is concerned, our percentage corresponds practically to those who have reported on this condition as incident in the enlargement of the prostate, but as I speak, I do not recall having read a report from our pathologists in any one case in which a microscopic ex-

amination was made that any form of syphilitic change was noted.

Dr. W. F. Martin, Battle Creek, Mich.: I observed three cases this year, one of chancre in the urethra. This man presented symptoms of gonorrhea, but the discharge contained no gonococcus. Urethroscopic examination revealed an ulcer in the anterior urethra. I did not recognize the active factor in this case until later secondary symptoms developed, and this lesion immediately recovered with the proper treatment.

Another was a case of marked cystitis which I suspected, upon examination—both from the clinical history and also cystoscopic—to be tuberculosis of the bladder, but persistent search for the tubercle bacilli did not reveal them, and further studies showed the patient had a positive Wassermann. Suitable treatment cleared up all the symptoms.

I also had another patient this summer with an acute nephritis that proved to be due to syphilis —secondary syphilis. He had a very small chancre some three or four weeks before I saw him, and presented himself for the treatment of the nephritis, because of edema and rapid pulse and albuminuria, but we decided that this was due to the syphilitic infection, and after carrying out suitable treatment he recovered entirely from the nephritis.

Dr. G. Kolischer, Chicago: There are two points about this discussion that are particularly interesting to me. First, generally speaking, there is no chance of making a diagnosis of syphilis of the bladder by the mere inspection of the bladder. There is absolutely no characteristic difference, for instance, between a tertiary syphilide of the bladder or the breaking-down of an infiltrated cancer. Such a diagnosis is impossible. There is only one condition where the observer is bound or forced to think of syphilis, and that is in case of a leukoplakia of the bladder which cannot be distinguished by any mucous placques, especially if we use a very strong magnifying cystoscope, or bring the prism of the cystoscope very close to the spot, and in this way enlarge it in our field. Then we see that this white speck has not the uniform surface, or that the surface consists of a little white syphilide. Then we have to think of a syphilitic condition. It is only the laboratory tests, in such bladder conditions, that make the diagnosis definite. The mere aspect cannot do it.

Second, as to the value of trabeculation of the bladder so far as tabes is concerned: I have repeatedly taken occasion to point out that trabeculation of the bladder is pathognomonic only if we are in a position to exclude all other causes for trabeculation of the bladder, that is, an obstacle in the urinary flow, which leads to hypertrophy of the bladder, because it has to make increased efforts. This is especially true if the man is of a nervous disposition. So that hypertrophy is not the product of extreme effort in each contraction, but

the product of such numerous contractions. In other words, we have to qualify these statements a little.

Dr. H. L. Kretschmer, Chicago: The fact has been mentioned that syphilis of the kidney may cause hematuria. I would like to call attention to Loewenhardt's report of a case of essential hematuria in a woman, in the days before the Wassermann test was known. This patient was given K. I. and mercury, and the hematuria stopped. Loewenhardt assumed that the woman was suffering from syphilis of the kidney. Later, when the hemorrhages were so severe that they would not yield to antisyphilitic treatment, nephrectomy was carried out. Examination showed large amounts of lymphatic tissue in the renal pelvis. The condition was found to be one of pyelitis granulosa, which was undoubtedly the cause of the hemorrhage, and not, as supposed, a syphilis. So I think we must be a little careful in interpreting our therapeutic results.

Dr. A. Ravogli, Cincinnati (closing the discussion): I am glad to hear that everybody agrees that syphilis affects the prostate and the genito-urinary tract and bladder.

I agree perfectly with what Dr. Kolischer said, that it is nearly impossible to make the diagnosis from the cystoscopic appearance of the bladder, and he is perfectly right, but we must remember also that in the skin sometimes we find that it is extremely difficult to make diagnoses between a case of variola and papulo-pustular syphilide. It is the same thing in the condition of the bladder. Of course, the Wassermann test and all the different concomitant symptoms will give us the right to make the diagnosis of syphilis of the prostate.

* * * * * * *

"Local Anesthesia in Operations of the External Genitalia and Prostate," by Dr. A. C. Stokes, of Omaha, Neb. (February issue this journal.)

"Radiotherapy and Diatherm-Therapy in Malignant Tumors of the Bladder," by Dr. Gustav Kolischer, Chicago (February issue this journal.)

Discussion.

Dr. F. C. Herrick, Cleveland, Ohio: Mr. Chairman: I have been very much interested in Dr. Stokes' remarks, particularly because I have had better success. Some of his precautions struck me as being good to remember. However, I cannot agree with him as regards morphine. I think one-quarter grain of morphine brings the patients to the table with less nervousness and more relaxation, in a numb state, in itself conducive to local anesthetic, and thus they get along very much better.

However, I am with him absolutely as regards the haste of the operation. As he suggests, I first take care of the skin, waiting perhaps five minutes

before beginning the incision at all; then going through the skin and coming down to the fascia and injecting a few minims. Then inject on either side by stab punctures, first taking care of the line of incision, going through muscles and injecting again, and again waiting a few minutes before going into the peritoneum. I think haste has given many patients more pain in the past than anything else. I tell my patients that if they have the least pain I will wait. In that way I gain their confidence and have been able to do a number of abdominal operations, and with quite a bit of comfort to the patient.

In operations on the scrotum I believe there were two men from Boston, Dr. Crosby and another, who spoke of performing epididymotomy under local anesthesia. They injected along the cord and the base of the scrotum. This did not appeal to me, as the area seemed rather hard to sterilize. I have performed epididymotomy by grasping the scrotum, finding the point I want to incise with the left hand, and holding it there. Then, with the skin drawn tense over the epididymis, I anesthetize the skin by blebs of injection, waiting a few minutes, going through it, and then going deeper with the anesthetic, and thus going step by step, without dropping the scrotum until the epididymis is opened, drained and stitched. That can be done with quite a lot of comfort to the patient, I think, and without the danger of wider anesthesia, as mentioned by Crosby of Boston.

I have never performed suprapubic prostatectomy by means of injection of novocaine. It is a good suggestion, and I shall use it. I have gone into the bladder with local anesthesia, and then, by giving a little ether, have taken out the prostate very easily. That has given very good results in the cases that would otherwise lead to a dangerous condition.

I think we can do very much more with local anesthesia, carefully and slowly, than in the past.

Dr. R. H. Herbst, Chicago: Just a word in favor of local anesthesia in bladder and genital surgery.

During the last year I have done the major part of my work with local anesthesia. In prostatectomy I opened the bladder with novocaine and have gas administered for the enucleation of the gland, as I have never succeeded in anesthetizing this area to my own satisfaction. I agree with the statement made by Dr. Vevan this morning, viz., that much of the success of local anesthesia depends upon the intelligence of the patient. It is difficult to practice this method upon the average clinic patient, who, as we know, is not very intelligent. I commonly use a solution of calcium and magnesium chloride with novocaine believing that this not only prolongs but also intensifies the anesthesia.

Dr. B. M. Ricketts, Cincinnati: About

October 6, 1896, I saw Rossa do the first operation in America with local anesthesia, namely, the enucleation of an eye. Since then I have used it with very great success, in amputation of the breast, gall-bladder work, appendectomies, and so forth. I used cocaine until the last four years. Since then I have been using novocaine.

I am an advocate of the extensive use of local anesthesia. I saw some very excellent work this morning, and with one exception did not see an operation that could not be done with local. I would like to ask Dr. Herbst why he did not do the operation this morning on the epididymis under local.

DR. HERBST: I did.

DR. RICKETTS: If he did, the patient suffered. The lips were pale. He gave all of us the impression that he did not have the proper local anesthesia.

So far as removing the prostate is concerned, I attempted to remove the prostate some twenty-seven years ago under the influence of local anesthesia, and I made a failure. I thought I was ingenious and got a piece of metal into which I had teeth cut. I put this on my finger and endeavored to remove the prostate with it, but failed. I did not get sufficient local anesthesia to do it.

I must congratulate anyone who succeeds in using local anesthesia. In Cincinnati we have about five hundred thousand people. I have been making observations for the last fifteen years on the use of general anesthetics, and have concluded that from fifty to one hundred die annually from pulmonary anesthesia—that means endocarditis, pericarditis, pulmonary embolism, cerebral hemorrhage, pneumonia, bronchitis and so forth. We have one hundred million people in the United States, which means twenty thousand deaths annually from pulmonary anesthesia. Say it is ten thousand deaths from anesthesia. That is too many. Five thousand are too many. Two thousand are too many. In Cincinnati I have seen two deaths resulting from pulmonary anesthesia following the operation of circumcision, and one man was driven out of the profession. There is no need of using general anesthesia.

I must compliment the essayist on his endeavor in this line to bring it before the profession, and make more general use of local anesthesia.

DR. R. H. HERBST, Chicago: Replying to Dr. Rickett's statement that the patient I operated in the clinic at Rush College showed evidence of pain, I will say that my subject was an unintelligent man who was thoroughly frightened before he came into the clinic.

If Dr. Ricketts had remained long enough to see the operation on the left side he would have heard my patient admit on being questioned, that the operation on both sides was practically painless.

DR. RICKETTS: I am quite sure that is true.

Dr. W. F. Martin, Battle Creek, Michigan: I was interested in Dr. Stokes' paper. In the last year we have been using it almost entirely in our clinic. We have been doing our prostatectomies by going down to the prostate with local anesthesia, and in two cases we have done a complete suprapubic prostatectomy with the local anesthetic, much to my surprise without pain. I have always feared that in removing the prostate under local, there would be a certain amount of traction pain. In talking this over with Dr. Hertzler, he assured me that there is some, although Allen says not. I was inclined to believe that Allen was rather stretching things. We found he was not. However, I believe that in prostates it is best to anesthetize down and through the bladder, and then use gas-oxygen. I think gas is an important addition to the equipment. Furthermore, I think we should have a sufficient supply of syringes, so that we would have no trouble with one getting out of order.

Relative to the vas work and the epididymal work, in the latter we have generally used general anesthesia. In the vas work we have used local entirely.

I might add that in the suprapubic work, if one has confidence in the patient (and that depends a great deal, as Dr. Herbst says, on the intelligence of the patient), one need not have any trouble.

Up to a few months ago we have been using 1-500 cocaine, and have never had any trouble. But we became frightened by the trouble some of our confrères experienced, and now use novocaine. We use morphine first.

Dr. W. E. Lower, Cleveland, Ohio: I have been very much interested in this discussion. The mere fact that for a considerable period of time we have been able to accomplish certain results by certain methods, does not necessarily prove that those methods should be perpetrated; or that better results may not be achieved in other ways. For example, an important factor in operation which has been practically ignored in the past is the psychic factor. We know that at times just as great shock may result from psychic as from physical causes. For this reason, it seems obvious that if the dangerous psychic factor can safely be lessened or removed by drugs, then drugs should be used. In our clinic morphia, generally in combination with scopolamine is used for this purpose, being administered an hour or more before every operation, whether it is to be performed under local or under general anesthesia.

In prostatectomies I employ the so-called Anociation method, using nitrous-oxid-oxygen as the general anesthetic, and thoroughly infiltrating the tissues around the prostate with a local anesthetic—novocaine—after the bladder has been opened. As is well known, however, it is quite possible to remove the prostate under local anesthesia alone. By the use of a special long curved needle the

tissues around the prostate can be so completely infiltrated with the local anesthetic that the gland can be enucleated without causing the patient any special discomfort.

We use novocaine for local anesthesia in cystoscopic examinations and intravesical operations, as we believe it to be much safer than alypin. Formerly I advocated the use of alypin in these cases, as it was then considered to be a harmless drug. I believe, however, that a death which occurred in the genito-urinary dispensary in Cleveland a few years ago, was probably due to alypin. The patient was prepared for a cystoscopy, alypin being used. Suddenly the patient became violently ill and died. While we could not prove this death was due to alypin we were strongly suspicious that such was the case and therefore discontinued its use.

I was very much interested in Dr. Kolischer's paper, and especially his prospective results. To me, operations for malignant tumors of the bladder are discouraging procedures. I think I have tried practically all methods, none of which has been entirely satisfactory. It is surprising, however, to see how comfortable patients can oftentimes be made when the entire growth cannot be excised and the hot iron is used to burn down the tumor. I have had quite a number of these cases in which after the operation the bladder wound has closed entirely and the patient has been able to empty the bladder completely and has been free from hemorrhages which had occurred before.

If we can cure these cases by the method described by Dr. Kolischer it certainly makes a great advance in the field of genito-urinary surgery.

DR. E. G. MARK, Kansas City, Mo.: I would like to ask Dr. Kolischer whether or not he used the diatherm-therapy through the cystoscope?

DR. JAMES A. GARDNER, Buffalo, N. Y.: I was sorry that Dr. Lower did not state the amount of novocaine he felt could be used with safety. Babcock stated last year that you can use one-half per cent. solution as you would a salt solution. Since that time we have used novocaine in prostatectomy and various other operations, doing the greater share of the work under local, and have used six or eight ounces of one-half per cent. solution without the least reaction. Babcock said he felt you could safely use a pint of a one-half per cent. solution. I wished to hear what Dr. Lower, who has had so much experience with it, felt could be used without reaction.

DR. FRENCH S. CARY, Chicago: I would like to report a rather unusual case of pyelotomy under local anesthesia. A stone was removed from the pelvis of the kidney with one-half per cent. novocaine injection. The patient had a stone blocking the pelvis of the kidney. The other kidney was the seat of a pyelonephritis, with very little renal function. We did not feel that the patient should have

an anesthetic, and so a local was used very successfully. The only pain experienced was when the kidney was delivered, and this subsided as soon as the pelvis was opened and the pressure relieved. The operation was entirely free from shock and practically no pain afterwards.

DR. J. S. EISENSTAEDT, Chicago: Regarding Dr. Kolischer's work with diatherm-therapy and X-ray, I think that it might be emphasized that the curative results are practically *nil* as regards the X-ray's influence on the tumor growth itself. The X-ray unquestionably, however, has three important uses in connection with malignancy of the bladder. First, as Dr. Kolischer said, it will clear up the cystitis. Second, its use in cross-fire with that of mesothorium. Third, as a prophylactic against secondary involvement following an operative attack upon the bladder, or mesothorium treatment. By that I mean raying a wide area particularly over the internal lymphatics and given very deeply through a three or five millimeter filter.

The technic of the X-ray itself deserves some emphasis. Short exposures are stimulating to carcinomatous growths. That has been definitely shown. We have seen some cases in the department which undoubtedly have been aggravated by the X-ray. The fact to be emphasized is this, that the treatment ought to be prolonged and given extremely deep, at least between eight and ten Bauer.

In regard to the precipitins, which Dr. Kolischer mentioned, they are made according to a formula of Dr. J. Walter Vaughan, of Ann Arbor. We make absolutely no claims for the value of precipitins. Dr. Kolischer is in very much better position than I to observe results. He merely thinks that he probably has prevented metastases since the precipitin has been used.

The value of mesothorium in bladder tumors cannot be questioned.

DR. G. J. THOMAS, Rochester, Minn.: Dr. Judd has been using the Percy cautery in these cases of cancer of the base of the bladder when resection is impossible and the introduction of mesothorium during convalescence.

DR. W. E. LOWER, Cleveland, Ohio: We use a 1 to 400 solution of novocaine and use it *ad libitum* and I have seen no toxic results. I think that weaker solutions might be effective, but I have seen no poisonous effects from even a stronger solution.

DR. A. C. STOKES, Omaha (closing the discussion on his part): I have nothing to add. I do not quite agree with some of the things said here. I think by leaving out the morphine a whole lot of the psychical shock is done away with. That may seem a very strange expression, opposite to what most men have said and felt, but my patients have not experienced so much shock. They used to get pale about the middle of the operation, but since quitting the use of the morphine they do not

get pale so often. And so I still think we should do without the morphine as much as possible.

I have never seen any bad results from alypin. I still believe that if we use it in dilutions of 1-400, that is pretty nearly plain water. Of course, we know that Halsted showed us years ago that even sterile water has a certain local anesthetic effect.

Novocaine in one-half per cent. solutions has some toxic effects. I think it should be used with some care.

One thing I wanted to emphasize, namely, that pulling and dragging must not be exercised under local anesthesia. All the dissections must be made by sharp instruments. It is wonderful how very few instrument makers there are selling good instruments around the country.

DR. G. KOLISCHER, Chicago (closing the discussion): I did not enter into the technic of diatherm-therapy and mesothorium, because they have already been published.

In answer to Dr. Mark's question, we must differentiate between fulguration and diathermism. Fulguration is the use of a spark produced by a high frequency current. Diathermism is the coagulation of tissue without producing a spark. We don't want to produce a spark. It is impossible to introduce the electrodes that are necessary in such a procedure, in using this immense amperage, through a cystoscope. We prefer to introduce both electrodes into the bladder for two reasons: In using such a powerful current there is always a danger in placing an electrode, if very large, on the body, because it may become detached, and if detached to a great extent we are sure to produce a burn on the skin. Second, it is much easier to get between the two electrodes in high position. You can change your electrodes in order to get the shortest route from one pole to the other, and that is the reason we use diathermism. Mere fulguration would not enter at such a depth. It does not destroy tissue to such an extent as the cooking of the tissue. With this diathermism we can boil down a pound of steak inside of fifteen minutes to a leathery flap.

All the other technical details will be dwelt upon in a publication by Dr. Schmidt and myself.

* * *

"Chronic Edema at the Vesical Neck Causing Symptoms Resembling Hypertrophy of the Prostate," by Dr. H. J. Scherck, St. Louis, Mo. (February issue this journal.)

"Non-Calculous Obstruction of the Upper Ureter," by Dr. G. J. Thomas, Rochester, Minn. (See March issue this journal.)

"Free Oxygen-Gas Treatment of Urinary Tuberculosis," by Dr. W. F. Martin, Battle Creek, Mich.

Discussion.

Dr. H. W. Plaggemeyer, Detroit, Mich.: Mr. Chairman: In regard to the point brought out by Dr. Thomas, namely, that in a number of cases of hypertrophy they have noticed a parenchymatous involvement as well, verified by the fact that the color test was appreciably higher than one would expect from the radiographic picture, I quite agree with him. I have seen a number of cases that were surprisingly high, but I do not think that this is in any way derogatory to the colorimetric functional test. I think the chief value to be obtained from such a case is to give us an idea as to the reserve force of the kidney. We are prone not to differentiate between the anatomic and pathologic lack of integrity on the one hand and the functional integrity, on the other hand. And this test, of course, gives us a very good index of the functional reserve force of the kidney, especially if the curve is a sharp, quick curve in the catheterized specimen the first fifteen minutes.

If the curve is an even curve in both fifteen minutes, or lower in the first than second, it shows that the kidney is working to its maximum capacity at that time at least. It is essential to know that functional capacity in addition to knowing the usual findings.

Dr. Wm. E. McCollom, Brooklyn: I just wish to call attention to a few points. Dr. Thomas mentioned the fact that the colon bacilli were present. I wish to ask if they are doing blood cultures in those cases. I have in mind a case or two in which vaccines from the kidney pelvis seemed to be not sufficient to relieve the kidney condition, and blood cultures of both kidneys proved to be streptococcus. The condition was cleared up. I have under treatment at the present time three cases in which I have been able to clear infection of the kidney pelvis with injection of living Bulgarian bacilli. Koch made the preliminary report on this work. My bacteriologist suggested the trial. It was first tried on a case of pyelitis, in which every possible means, such as vaccines and kidney lavage, was used, and the last five attempts to secure cultures of the kidney have failed. Of course, we do not use any urinary antiseptic when instilling the Bulgarian bacilli into the pelvis, and the Bulgarian bacilli alone, so far as I can tell, have cleared up the infection in this case, as well as two others, which I have had.

Dr. Meyers, of Brooklyn, mentioned some years ago that simple dilation of the ureters and better drainage would be of some effect, and I think that is probably the case. In these three cases, however, I have seen some good from the Bulgarian bacilli. I have wondered whether it was the Bulgarian bacilli or the lactic acid that has brought about the result. These cases have not been discharged, and I am watching them with considerable interest. I feel that the results have been such

that I shall continue the work. I have failed in many cases of lavage of the kidney, with silver nitrate, and other remedies. I think that has been generally so, and any new method of this kind, which would seem to bring results, I think would be worth an attempt.

DR. G. KOLISCHER, Chicago: I would like to call attention to the so-called functional tests, whether done in the old-fashioned way, to get green, blue or red urine, or in other ways. All these classifications of the test are nothing but excuses. In my experience, and the experience of others, for instance, Rovsing, it has been proven repeatedly that after removal of the kidney when all so-called functional tests were prohibitive of such removal, the patient was impudent enough to stay alive. On the other hand, during the last two years extensive experiments have been made at Cook County Hospital. There were a number of patients under observation, and Dr. Walter Hamburger, with modern tests, proved that the kidneys were up to the top-notch—could not be better. One of these patients had so little scientific conscience that he died from uremia shortly afterward.

As to edema of the prostate, I understood that Dr. Scherck was attacked lately at the meeting of the American Urological Association for making the statement that edema of the prostate would occur to such an extent that it might simulate hypertrophy. I am quite sure that there is such a condition. The first two cases I observed some years ago, when Dr. McKenna was associated with me. The first case was rather embarrassing because I tried to demonstrate my technic of suprapubic prostatectomy. After opening the bladder the tumor disappeared. Since then I have seen several such cases.

I would like to call attention to one diagnostic point during operation. Any time you expose the bladder and find a very thin wall, you have to think of this edema; that there is an hypertrophy of the prostate and constant obstruction to the flow of urine, which would lead to concentric hypertrophy of the bladder wall. How it could be diagnosed before the bladder is opened, I do not know. It can be seen afterwards. The tumor appears under your eyes. It is a fact.

DR. JAMES A. GARDNER, Buffalo: I cannot allow the occasion to pass without speaking of Dr. Thomas' paper. I think he has been very conservative in his report of the good resulting from lavage of the pelvis. I feel that lavage of the pelvis does more to cure up these cases of pyelitis than any other thing. Possibly the doctor has been so conservative in reporting the so-called cures because he wished to be very sure, and in the use of silver nitrate, as he states, pus will be found possibly for weeks after its use. If these patients could be observed for a greater length of time possibly the

pus would disappear. That is a difficulty at Rochester. They do not have the opportunity to prove up the number of cases that are really helped by the lavage. Therefore, the feeling that this lavage is not of importance should not prevail because it has been such a distinct advance that its importance should be emphasized.

DR. FREDERICK CHARLTON, Indianapolis, Ind.: One of the San Francisco men this summer, at the Section meeting of the American Medical Association, read a paper on cryoscopy, going into the subject at considerable length. It was discussed in various ways and with that discussion in mind I rise to ask Dr. Kolischer a question. Years ago I heard him read a paper on this subject and now wonder if his views remain the same. I find myself vacillating between two opinions. One time I believe the thalein test to be of service, and the next time I am very doubtful of its value. I have never done cryoscopy, feeling that while it may be remotely helpful yet it cannot have much place in the field of ordinary everyday work. I would like to know whether Dr. Kolischer has lost his enthusiasm for cryoscopy, as he seems to have lost it for the color tests.

DR. G. KOLISCHER, Chicago: In answer to Dr. Charlton, I will say that he misunderstood me in the paper referred to. The paper was a criticism of cryoscopy, as of other functional tests. That is, we test first the urine; then pass a stain through the kidney, and then test it again. By the opposition of any particles through the secreting cells a pathological kidney function will be interfered with, so as to create a standard for each kidney. We thought we did that, to a certain extent, at that time. I mention this fact, that it is impossible to create an arbitrary standard for a kidney. If it does not come up to our presumptive standard, we say it is no good. So I criticized cryoscopy, the same as all the other so-called functional tests, because I think they are no good. I am so convinced. The results prove it, although theory may be in favor of it. Remove one kidney, and all the so-called functional tests say you would not dare to remove it, because its mate does not come up to the standard, and the patient is still alive. After these tests I have found that the patient has two absolutely perfect kidneys, and yet died afterwards from uremia. Either the test or the patient is no good—I don't know which.

DR. R. H. HERBST, Chicago: A question relative to the subject of edema of the prostate, viz.: Whether some of these cases thought to be edema of the prostate might possibly be cysts of the utricle.

DR. E. G. MARK, Kansas City, Mo.: In the discussion of kidney functions this afternoon, I rather think there has been one good point overlooked, namely, the relative blood urea retention as regards the urine. That patient, of course, must be put upon a certain diet, knowing the amount of

ingestion of urea or proteids, and so forth. I think we are then in a better position to judge more about the condition of that kidney by means of relative blood, urine and urea retention, than by any other means.

I must say that so far the thalein test has proved fairly satisfactory in my hands.

DR. W. E. LOWER, Cleveland, Ohio: I want to ask Dr. Thomas whether he has ever had a case in which these tumors have suddenly disappeared. I have had one case in which a cyst of the prostate obstructed the urinary outlet, causing residual urine. A cystoscopic examination revealed a smooth, round tumor, having the appearance of being a part of the prostate. I started to do a suprapubic prostatectomy and while shelling out this tumor it suddenly collapsed and I felt the contents escaping. Upon examination I found the cyst had been filled with a whitish fluid. The sac was dissected out. This was apparently a so-called cyst of the prostate. I do not know how frequently these cystic tumors occur as this is the first case I have seen and I am sure they are not very frequently reported.

Just a word in regard to the functional tests; we have always felt that the phenolsulphonephthalein test is a very good indication of what the kidney was doing at the particular time the test is used, but that it does not give us definite information as to what the kidney may do under different conditions. However, I am not quite so pessimistic as Dr. Kolischer.

DR. H. L. KRETSCHMER, Chicago: In regard to Dr. Scherck's paper, I believe his case was one of edema of the vesical neck. I believe that when he opened the bladder the edema disappeared. Why did that patient have edema of the vesical neck? That is the point that interests me. If we will stop and go over the history, Dr. Scherck said that that patient had edema of the feet, hemorrhoids and organic disease of the heart. Certainly, the hemorrhoids and the edema of the feet are evidences of broken compensation, and I see no reason why he should not have edema of the vesical neck as well as of the feet. I think, therefore, that the edema, in this particular instance, was one of the evidences of broken compensation. I do not believe the condition was due to a cyst of the prostate.

I have had the good fortune to see two cases of cyst of the prostate. One case I saw early in my career, when associated with Dr. Schmidt. A few years ago I saw a similar case. From my cystoscopic findings I made a diagnosis of cyst of the prostate. I decided to puncture this cyst with Young's cystoscopic rongeur. Before I could open the rougeur, however, I had poked a hole into it, and it immediately disappeared.

I think that the most important point to be brought out in this discussion is one of diagnosis. Often one sees patients who have had pelvic lavage

carried out for a year or two. The thought uppermost in our mind should be, Why has the treatment failed? The answer to this should be a complete examination to determine the cause of the failure.

I recall one instance in which a woman was treated for a long time with pelvic lavage, vaccines and other accessory treatments, without result. The first thing I did was to have an X-ray made, and it showed that she had a recurrence of a pelvic stone.

I think lavage has a permanent place in the treatment of these pyelitis cases.

Dr. C. M. McKenna, Chicago: With regard to the case of Dr. Scherck, namely, edema of the bladder, I think a great many of those cases are due to pressure. I have seen three cases, one of which, a tumor, presented itself above the pubis, but went down immediately. In the next case a large tumor mass showed after the bladder was opened. It also went down and showed quite a large prostate gland afterwards. I think that the tumor itself was due more to pressure of the urine on the covering of the prostate gland. Both of the cases reported recovered and have had no recurrences.

Dr. James A. Gardner, Buffalo, N. Y.: Just a word in defence of the thalein test, if necessary, because what Dr. Kolischer has said rather damns the whole thing without giving it a chance. I feel that the Wassermann test and the microscope are not perfect but we use them as an aid in the majority of cases. I do not think any functional test can be said to be absolute but even if there is a failure or small percentage of failures, it should not be brushed aside. In certain cases the functional test gives us the cue as to the poor operative risk, which we otherwise might not have recognized, so that we build up the patient before operation and shorten the convalescence.

I agree with Dr. Kolischer that some of these men are so unscientific and that they have not done as well as we had expected, but you can quote from blood tests where the Wassermanns were negative and demonstrate syphilis afterwards. This may be due to faulty technic. That is so even with the stethoscope. Many times we do not find things but that is the fault of the man using the stethoscope.

Many of the functional tests have been of great aid since we have specific results to stand up by.

Dr. H. J. Scherck, St. Louis, Mo. (closing the discussion): In closing I desire to emphasize again the firm opinion that I hold that a superimposed edema on a slightly enlarged prostate, as well as on a very decided enlargement is a common occurrence. The practical deduction from this conclusion seems to be that as a temporizing surgical procedure certain procedures may be undertaken that may reduce the edema and give the patient relief for a certain length of time. These procedures may not be of a nature to afford any permanent re-

lief, but may serve as a useful purpose in delaying the operation until a future time when the patient becomes in a better condition to stand the major surgical procedure. I am quite certain the case that I reported was not one of cyst of the prostate as suggested by one of the gentlemen present, for the reason that the edema disappeared without a direct incision into the gland but the mass became reduced by a depletion incident to the division of the bladder wall.

Dr. Kretschmer's explanation appeals to me as being more in line with the case reported and in my paper I suggested the possibility of a condition described by Dr. Kretschmer as being the cause. The compression of the gland and lower vesical outlet by the fibrous sheath may have a bearing on this production. I have been so much impressed with the fact that the condition of edema of the lower vesical orifice involving the prostate is of such a common occurrence and with this case in mind in which this demonstration was absolute, the recital of this case has seemed to me to be of sufficient interest to have made a report of same before the meeting. The discussion which it has brought out confirms me further in my belief.

Just a word as to the value of the phenolphthalein test. The longer I make use of this test as an indication for kidney sufficiency, the more I lean to the belief as expressed by my friend, Dr. Kolischer. In certain types of kidney condition and in certain times of the individual's life it may have some bearing in estimating the potency of the kidney function, but I am yet to be convinced that because a kidney will excrete a dye stuff in a certain length of time, that the bi-products of metabolism will be handled by the kidneys in the same manner. This conclusion has been forced on me, not only from a theoretical standpoint, but on account of certain results that have been obtained experimentally in the wards of our hospitals.

Dr. G. J. Thomas, Rochester, Minn. (closing the discussion): Regarding functional tests, a case should not be operated on the findings of the functional tests alone. It must be remembered that the functional test is a corroborative laboratory method and not the decisive factor in the diagnosis of surgical lesions. Used in this manner, it has in a few cases helped us to get on the right path: For instance, a man with hematuria came to the clinic during the interval for examination. A differential functional test immediately indicated the kidney which contained the tumor, the existence of which was later proved by the pyelogram. Unless this patient could have been cystoscoped when bleeding, the diagnosis could not have been made without the aid of the functional test.

With regard to blood cultures, they were not made in these cases. We now make blood cultures as a routine procedure in all cases of residual urine

with prostatic involvement and, also, in all infections of the upper urinary tract.

As to the Bulgarian bacilli, we have used them in the bladder, but not in the kidney. We have had good results in some of the bladder cases but have employed the method in so few cases that I do not like to report the ultimate results from this small experience.

As Dr. Gardner mentioned, I did not emphasize lavage of the pelvis for the reason that many of these cases live a great distance away. My statements were based on the results of examination and not on what the patients wrote regarding their condition. It was not possible to cystoscope them after prolonged treatment, but as long as they were at the clinic I insisted on the urine being free from pus before pronouncing a cure. When silver nitrate is employed, this is not always possible, but many of these patients were culturally free from organisms. From the number of cases in which the urine did clear up, it is apparent that pelvic lavage is the best procedure in the treatment of pyelitis and pyelonephritis.

* * * * * * *

At the Saturday afternoon, November 13th, 1915, session, the following papers, passed over from the Friday session, were read:

Dr. F. R. Charlton, Indianapolis: "A Very Unusual Case History Presenting Among Other Features a Cystoscopic Burn." (See February issue this journal.)

Dr. W. S. Ehrich, Evansville: "The Bladder in Early Tabes." (See February issue this journal.)

Dr. E. G. Mark, Kansas City: "A New Type of Operating Urethroscope." (See February issue this journal.)

Discussion.

Dr. Robert H. Herbst, Chicago: In connection with Dr. Ehrich's paper I wish to briefly give the history of a case which I reported at the last meeting of the Urological Society.

Patient T. K. Age 50. Denies gonorrhea. Fourteen years ago, age 36, developed a lesion on the penis which he states was burned off. Denies ever having had eruptions on the skin or lesions in the mouth. About 7 years ago developed loss of sexual power at about the same time he noticed some difficulty in starting the urinary stream. Within six months after this he began to have frequent and imperative urination, being compelled to urinate about every two hours diurnally and from five to seven times at night. He also complained of suprapubic pain, for all of which he was given bladder treatments.

For the last three years has had a dull pain above the eyes and severe headaches. Examination of eyes made just previous to time at which he came into our hands disclosed the following: Arteriosclerosis of retinal vessels and very red disc, with

blurring, suggesting an optic neuritis. No error of refraction worth considering.

Neurological findings at about the same time showed reflexes slightly inhibited.

Four years ago developed severe gastric crises for which a gastrotomy was performed. Pains in stomach have continued since.

Upon examination we found urine containing pus. Examination of urethra and bladder neck gave no evidence of any obstruction. However, cystoscopic examination revealed a marked trabeculation of the bladder. A Wassermann test made at this time was strongly positive.

If you will look over this history you will note that this patient evidently contracted syphilis fourteen years ago and that seven years later he noted two symptoms which we so commonly see early in the development of spinal cord syphilis, viz., loss of sexual power and difficulty in starting the urinary stream.

Being a non-believer in the condition known as atony of the bladder as a cause of urinary stasis, there are left just two possibilities as to the cause of retention in this case. 1st. Obstruction. 2nd. Interference with the innervation to the bladder. As stated before at the time of our examination there was no evidence of any obstruction.

You will also note that his eye symptoms did not appear until years after the urinary and sexual disturbances.

Had this patient's urinary symptoms been investigated seven years ago and a trabeculated bladder found without obstruction as the cause there could have been but one interpretation possible, viz., a beginning change in the spinal cord. Had he been given appropriate treatment at this time I feel certain that his optic nerves might have been saved and the gastrotomy which was evidently performed for gastric crises could surely have been avoided.

DR. B. C. CORBUS, Chicago: Syphilis of the bladder is only part of the passing show in general syphilis. The cord can be attacked in any of its segments. The blood Wassermann does not amount to anything in tabes in 60 per cent. At the time we get bladder symptoms it is too late to do any good. During the last two years I have made 150 punctures. Syphilis localizes in some individuals in the muscles, skin, etc., and in others early in the spinal canal. It is our duty in every case that comes to us, if there is a previous history of syphilis, to take the Wassermann. The time to do any good is early and you must make a spinal fluid investigation of every case with syphilis. I cannot agree that trabeculation of the bladder is an early sign of tabes.

DR. E. G. MARK, Kansas City, Mo.: I believe that the general practitioner or even the neurologist if approached with the same symptoms as have been presented in a number of cases we have seen, would not have made the diagnosis. Take

these same cases and spot them out and tell them, "Here is a case of tabes," and the neurologist will find eye reflexes, the achilles reflex gone, etc.

An interesting early case came to us a short time ago in which the patient had a chronic urethritis. At the time we questioned him as to his general history. He gave no history and denied any history of a sore. In treating the case in using a posterior instillator it was found there was some residual. This was finally called to my attention by my assistant, and we cystoscoped him. The findings, to my mind, in spite of what Dr. Corbus has said, were typical of tabes. There is no doubt, as Dr. Corbus says, the vesicular crises in the bladder may be something else. We may have gastric crises and other vesicular crises in which there is no sign in the bladder; but in this case there was a very prominent intraureteral ridge, and post-trigonal to the side and back of the ureters, fine trabeculation. We do not expect to find a Rhomberg except in late cases, nor do we expect to find much loss of patellar reflexes. This man's achilles reflex was gone, which is the earliest lost reflex in tabes, I believe. The Babinski sign was also present. He had the lack of pain on deep pressure in the leg muscles, which is rather characteristic. His eyes were perfectly normal. The knee reflexes were equal, with the exception, possibly, of only slight slowing in the right patellar reflex. The laboratory findings in this case were positive. He finally acknowledged having sores twelve years before and had gone to Hot Springs where they told him there was absolutely nothing wrong. He went back a year ago and they told him there was no use taking the Wassermann. On examination in this case we found a 4 plus blood Wassermann and a 4 plus spinal positive. The cell count was 60 and the Gold solution test was pronounced in 3, 4 and 5, which gave an absolute diagnosis of tabes. I should like to have some one tell us what to do.

Dr. I. S. Koll, Chicago: I believe we have a condition in the bladder which we can call the luetic bladder—I do not believe we can say tabetic. In the past two months I have seen two cases in which it was impossible to elicit tabes, with 4 plus Wassermanns, in which rigidity of the ureteral orifices was present. The trabeculæ were of the papillary type. I found what I believe was a gummatous condition of the bladder, from the fact that the mucous membrane had lost its luster, there were no blood vessels such as we see in the normal mucous membrane, and the tonicity of the bladder was gone. The patient had incontinence. The tabetic bladder is more nearly of the type that has been described, and of which I now have a record of 36 cases, 27 of which were reported at Philadelphia. The following points should lead us to make a positive diagnosis in the absence of every other sign of beginning tabes. Lateral trabeculation, fine in character, in contradistinction to obstructive trabec-

ulation in prostatic enlargement and stricture; the prominence of the interureteric area, and rigidity of either one or both ureteral orifices, though this latter point is not absolutely constant. I do not know how to explain it, but I believe it is somewhat comparable to the Argyll-Robertson pupil —possibly a sclerosis of the blood vessels of the ureteral orifice.

DR. G. J. THOMAS, Rochester, Minn.: In the Mayo clinic we see many spinal bladders. We have noted the points just spoken of—beginning anesthesia of the posterior urethra with relaxation of the sphincter. Such cases are sent to the neurologist who makes the neurologic tests and plats out the sensation. He has frequently found what he considers early loss of sensation about the perineum which, with the finding of trabeculation in the bladder, warrants a diagnosis of cord involvement, which is most often tabes. I recall one of Dr. Braasch's cases in which no venereal or urinary history could be obtained that was found clinically to be a typhoid condition of the spine. In this patient there was the typical trabeculation of the bladder with relaxation of the bladder and sphincter. I am sorry Dr. Corbus did not say more about early syphilis in which he has found a positive spinal fluid because this is important and he has observed and reported a large number of such cases.

DR. B. C. CORBUS, Chicago: I do not deny that there is trabeculation in tabes of the bladder, but we cannot make it a pathognomonic or diagnostic sign. I find in these cases without symptoms about 1 in 4 show spinal fluid involvement, with a negative blood Wassermann. The idea is to get them before they reach the tabetic stage. Whether it begins at the top or bottom the achilles reflex can be involved. There is where the syphilis begins, and may advance, or later involve the bladder, but it is all syphilis, up and down.

DR. H. L. KRETSCHMER, Chicago: Trabeculation of the bladder means one of two things—either obstruction in front of the neck of the bladder, such as a prostate, a stricture, tumor, etc, or it means an obscure lesion of the central nervous system. I cannot agree with Dr. Mark that when you find trabeculation you may make a diagnosis of tabes of the bladder. I do not want to cite personal cases, but I have seen trabeculation of the bladder, for instance, in cases of myelitis and in cases of traumatic injury to the cord. I recall one man who was operated on for osteoma of the spine. Following the operation he had a hemorrhage into the cord with a resulting paralysis of the bladder which later showed very marked trabeculation. One man had multiple sclerosis with trabeculation of the bladder. So that when I use the cystoscope and see this fine trabeculation without obstruction I diagnose some obscure lesion of the central nervous system. Then I try to find out what type of lesion. I think papers of this kind bring out the fact, as was

brought out yesterday, that we are a part of the entire realm of medicine, the entire realm of diagnosis; that we cannot attempt to diagnose tabes by looking through a cystoscope; we have got to go over the whole body. Dr. Thomas says when they see these cases they turn them over to the neurologist. In tabes one may see an early perineal anesthesia and loss of deep muscular sensation; so that I do not think the bladder condition is primary; it is simply part and parcel of the whole picture. I should like to know how to recognize these tabetic bladders. How can we differentiate cystoscopically the trabeculation of tabes, multiple sclerosis, myelitis, etc. Possibly the sign of which Dr. Koll has spoken—rigidity of the ureteral orifice —would give us some aid.

* * * * * * *

Symposium on Diseases of the Seminal Duct.

Dr. R. B. H. Gradwohl, St. Louis: I have been interested in Dr. Belfield's work for some time. My attention was more particularly drawn to it by an opportunity to have Dr. Jost work out these cases with me. From the standpoint of the bacteriologist I can corroborate what Dr. Schmidt has said in regard to gonorrheal infection. In this series of about 40 selected cases the organisms found were staphylococcus albus; in a relatively small number it was the gonococcus at the time they came for treatment. This was verified both bacteriologically and by the complement fixation test. My opinion on the value of this method would be necessarily more from the standpoint of the laboratory man than that of the surgeon, but this seems to be a logical procedure, vasostomy with drainage, in cases which have resisted the ordinary medical measures by the practitioner. So far as vaccine therapy alone of this class of cases is concerned, I believe it is exceptional to find good results. In some cases we have seen good results, but it seems to me this form of therapy, unaided by surgical intervention, has been a great disappointment, so that the hope of radical cure rests with the surgeon. Dr. Jost will tell you about everything else we have learned together.

Dr. William E. Jost, St. Louis: Following the masterly manner in which Dr. Belfield has handled the subject of vasotomy, there is little left for me to say, yet it is exceedingly interesting for us to review the old-time methods in attempting to clear up infections of the seminal tract and contrast them with the modern methods of today. The former were failures; the latter successes. Dr. Belfield's paper in December, 1909, afforded us a new line of reasoning and made a new angle of attack on what has proved to be the hardest nut for the neurologist to crack, namely, infections of the seminal vesicle. The infections from the gonococcus as well as other seminal tract infections have until

the past few years found a fortified home in this part of the human anatomy. They have defied any and all attempts to cause their extermination. Since the operation of vasotomy opens up a new avenue of attack, the pus organisms whose habitat was heretofore located in the seminal vesicles have been forced to come in direct contact with argyrol and after a brief encounter were successfully repulsed. Such is the result of relieving tension by drainage and properly medicating the seminal tract. It is a decided victory for the urologist, to say nothing of the unfortunate patient. The vasostomy operation affords him his formal release. I want to go on record as being a staunch believer in this surgico-medical procedure. It is the only known recognized method to exterminate infections in the seminal tract, which are in the great majority gonorrheal. It becomes the duty of the urologist to trace out the etiology of many reflex conditions, not only in the pelvis, but also in the abdomen. It is surprising how many sources of irritation are definitely traced to the seminal tract—vesicle, vas or epididymis. I concur with Dr. Belfield's statement that many cases of "irritable bladder, chronic cystitis, impotence, sterility," as well as the various neuroses, are due to prostato-vesiculitis. I have quite an interesting class of such cases, who have proved very grateful patients indeed.

I was attracted to vasostomy by Dr. Belfield's paper in 1909, because in my hands all other measures in seminal vesiculitis had failed, in spite of the fact that there was no encouragement in my medical vicinity in corroboration of Dr. Belfield's work. At the very beginning in trying it out I was more than gratified with the results. The group in which I have tried vasostomy now numbers about 40 cases, representing cases which had failed to respond to other forms of treatment, which had been applied not only by me, but by others, consisting of massage, injections, instillations and vaccines, carried out over a number of months, and in some cases years. In passing I might state that one patient had been treated for eighteen years without success and was permanently relieved by vasostomy.

In the beginning of my experience some of my failures occurred by reason of the fact that I operated on but one side, hoping that this would suffice, and these patients later refusing a second operation on the other side. It was impossible to say whether the operation had failed because the wrong side had been primarily selected. After adopting the method of double operation at one sitting I have seldom failed. Of course in some of these cases the complicating factor of disease of the verumontanum had to be attended to by local measures. I use Dr. Belfield's original technic, excepting that I have a skin hook bent at right angle which I slip through the skin and under the vas before making the incision. I also use a blunt

pointed cannula in the vas and permit it to remain in place by suturing it to the skin.

We should look into cases of impotence and sterility more carefully and more energetically, and I am satisfied that after proper surgical procedure on the seminal tract, together with thorough medication of its interior, in many cases the spermatozoa will resume their motility, regular form and function. It is really surprising how many cases diagnosed as lumbago both by the general practitioner and the laity prove to be in the hands of the urologist "prostato-vesiculitis." Some cases improve to some extent after massage of the prostate, but treatment of both prostate and vesicles is imperative. There is no doubt that the general practitioner allows many cases of this kind to go unrecognized, and consequently untreated. "Pus Tubes in the Male" must be recognized as correct nomenclature for the infection of this part of the sexual apparatus. Attacking at or near the inferior end of the seminal tract to relieve tension, drain and medicate the interior, is certainly "getting at the bottom of things." The synergistic action of vasostomy, plus autovaccines, enables the urologist to carry on a successful warfare against the entrenched army, which, on account of its strategical importance, has selected the seminal vesicle as a base for irritative, toxic and reflex operations. It is a clinical fact that the vesicle distends sufficiently to allow the injected medication to come into intimate contact with its interior before the duct's sphincter relaxes and allows the liquid to escape through the ejaculatory duct. This is fortunately a very happy "order of things" as the medication remains in the cavity of the seminal tract sufficiently long to be effectual. It is amusing to listen to the patient tell of his nocturnal ejaculation of argyrolized seminal vesicle contents.

My case records show that the procedure of vasostomy, supplemented by proper injections of argyrol, vanquishes the majority of these infections. Before Dr. Belfield announced his successful exploration of this secretory canal, its peculiar anatomical position and the utter impossibility of medicating its interior, guaranteed failure and disappointment in the attempt to eradicate this disease, long baffling the medical man and producing dissatisfied and disheartened patients.

Dr. W. E. Lower, Cleveland, Ohio: This symposium on the seminal vesicles has been most interesting to me. The anatomy of these structures has been beautifully demonstrated, and also the already well-standardized operative procedures upon these organs. After seeing the picture shown by Dr. Smith, however, I am not quite sure that simple drainage is going to be sufficient to relieve many of these cases, but wonder if we must not expose the entire seminal vesicle and ferret out all the pockets and drain them. The evidence by which this procedure is going to be measured will, of course, be the clinical results. These operations

have now been practiced for a sufficient length of time for the results to be carefully tabulated. If the American Urological Association would ask for end results in these cases we should know whether or not we are getting the relief which we are seeking. We must know whether these patients are permanently benefited and what are the post-operative complications. If the end results are going to be as good as they seemed to be from early reports, we have certainly made a great advance and have found a procedure which we may well hope will clear up many of these difficult and annoying cases. After all we must not deceive ourselves, or let our enthusiasm in operative technic blind us to the postoperative results.

Dr. E. G. Mark, Kansas City, Mo.: We have done something like 150 vasostomies, and in practically all cases we have had good results except in those cases in which we used too high a percentage of silver salts. It has occurred to me that we strike so many of these cases in which the duct is not patent, and if it is not patent what is going to happen under the injection of a silver salt or any other fluid in the vas, as Dr. Belfield has said, must occur, and the same thing, it seems to me, would occur with a vesiculotomy. If you do a vesiculotomy with a stenosed ejaculatory duct you are going to have continuous drainage from that vesicle. I believe that marks, to a certain degree, the turning point in vesiculotomy and vesiculectomy. That has in a marked degree, except in fibrosis, determined our choice between vesiculotomy and vesiculectomy and we have in no way been influenced by impotency.

With reference to Dr. Staley's paper regarding epididymotomy, one who has studied the anatomy of the epididymis must know that when he plunges a knife into the epididymis he practically short circuits the whole thing, so that the testicle must be sterile on that side. Whether there is pus there or not, if one could by a careful dissection go down and simply relieve the tension caused by the binding down of the fascia one would do good, but if we attempt to make a puncture in the epididymis or to split the epididymis we are going to do more harm than good.

Dr. V. D. Lespinasse, Chicago: I am sorry Dr. Sanford misunderstood me. The epididymis is one continuous tube and there are no blind channels at all, but one tube coiled up in a number of pockets, with connecting tubes between the adjoining pockets. In epididymitis the distension is so great that the tubes are in contact with the capsule, and in blind stabs you are almost sure to cut the tubules. If you try to dissect out the epididymis and show the complete anatomy it is very difficult to remove the capsule and not cut the tubules. So I should warn any one who tries to perform an epididymotomy to certainly expose the epididymis, and in cutting down through the fascial layers to exercise

great care as they approach close to the tubules so as not to cut them. When one is down close to the capsule push a forceps in and separate the structures then with a director hold the tubules back and snip the capsule. A blind stab with a knife into the epididymis is very risky. With a needle it is not so. With a needle you can go in for various purposes, and I do not think the tubules close up after puncture with a fine needle, although I have no absolute evidence as to this.

Dr. G. J. Thomas, Rochester, Minn.: We have seen a few cases of what we considered to be primary tuberculosis in the prostate in which we were unable to demonstrate lesions in the epididymis or kidneys. In a case now under observation the prostate feels tuberculous; tubercle bacilli and pus have been found in the urine. Repeated examinations of urine from the kidneys have shown no organisms, and guinea-pig inoculation has been negative. The pyelographic outline seems to be normal in both kidneys and there is equal function. This case would appear to be one in which we can be fairly sure of primary tuberculosis in the prostate. At the present time the man has no other tuberculous lesions.

Dr. F. R. Charlton, Indianapolis: I am pleased that the question of epididymotomy has taken the course it has in the discussion. I have been rather loath to express myself about epididymotomy for fear of expressing too radical disagreement. It is an operation as old as surgery, and yet it comes into vogue in the last few years with a name and a fame which it seems to me are utterly unwarranted. After all is said and done, the procedure is nothing but the puncture of an abscess. You may discuss punctilios as to the question of drainage but surgeons in our grandfathers' time punctured these abscesses and drained them. I remember some of the first minor surgical cases of this sort that I ever saw were to all intents and purposes epididymotomies. It has always seemed to me to be vicious practice, except when done to relieve extensive pockets of pus, and has never seemed to be warranted except for such a condition. I am perfectly willing that the patient should undergo some pain for a few days if in the end he might get complete resolution, and you do get complete resolution in many cases of epididymitis. I have been able to examine the expressed contents of the vesicles in perhaps half a dozen cases in which there had been a vicious double epididymitis, and have found spermatozoa in several of that series of cases. Dr. Edward Martin, of Philadelphia, some years ago reported on this. I heard him say years ago that he had demonstrated active spermatozoa after vicious double epididymitis. That being the case, the situation is not hopeless at all. The patient certainly has a very good chance of retaining his potency after an acute attack of single or double epididymitis. When you do an epididymotomy you

sterilize the individual. I am satisfied if you cut deep into the capsule you cannot help but do it. And feeling in that mood about the situation, I have never done an epididymotomy except to relieve extensive pus infiltration. I do not believe it is good practice except in such advanced abscess cases.

DR. E. G. MARK, Kansas City: Dr. Lespinasse, would it not be a good idea in cases with extreme pain, and in the cases Dr. Charlton speaks of, to loosen up the capsule and relieve the tension? For that is where we are getting the pain.

DR. CHARLES M. MCKENNA, Chicago, Ill.: The question that Dr. Marks has asked is the key to the situation. I do not think that in doing an epididymectomy the pathology of the epididymis alone should be considered. It will be remembered that on doing this operation the various fascias about the epididymis and testis are involved and the tension brought on these various fascias gives the patient a tremendous amount of pain. Upon making an incision through the layers of fascia to the epididymis proper this tension is relieved, and as a result the patient will rest more comfortably.

Now as to the question of making the patient impotent: I think this is considered by many from a different point of view. As the other gentleman has said, "A blind stab might cause an impotency." Of course it would, because he cannot see the anatomical structures involved. I agree with the gentleman in that statement. However, if after a careful dissection is made down to the epididymis and the different fascias are separated from each other and from the testes and epididymis, the epididymis proper is in plain view; then, if with a fine pointed bistoury a small incision is made in the anterior wall of the epididymis and a gutta percha drain inserted, the smaller tubules leading from the testes will not be destroyed, thus rendering the patient less apt to be made impotent than if the condition were left to be absorbed by nature. In my last two cases I have made a dissection and separated the fascias, with very gratifying results.

Conclusion.—I think if this method were carried out more extensively, even without making incisions in the epididymis, better results would be had. After all, this operation is done to relieve the patient of pain.

DR. I. S. KOLL, Chicago: A point in diagnosis in connection with the masterly presentation by Dr. Plaggemeyer I think is worthy of emphasis, namely, the differential diagnosis between chronic inflammatory conditions of the epididymis and tuberculosis of the epididymis. In the past year and a half I have seen six cases, two of which were in Dr. Schmidt's service at the Michael Reese Hospital, in which clinically there was every indication of tuberculosis of the epididymis. I had seen four cases previously, and was keenly interested to know what the pathologist was going to say. Serial sections were made from the entire gland and no evi-

dence of tuberculosis was found, but chronic inflammation due to the pyogenic organisms. The four other cases presented the same type of lesion. In three of them cultures were positive—one of the streptococcus and two of staphylococcus. I think this point is of particular importance in regard to our postoperative treatment, besides relieving the mind of the patient of the possibility of his having a recurrence of a tuberculous condition. I believe in a certain percentage of these cases it is impossible to make a definite diagnosis of tuberculosis until the microscope has proved it to be that.

Dr. J. W. Marchildon, St. Louis: Some years ago in Berlin I ran across a case at necropsy of infection of the seminal vesicles with the typhoid bacillus, and at the same time a second case of infection of the prostate with typhoid. These cases were worked up at that time and reported from the standpoint of typhoid bacillus carriers, and especially as an example of the source of infection of the urinary bladder in those cases in which infection repeatedly takes place with the typhoid bacillus. We had always thought the gall bladder was the ordinary place to harbor the typhoid bacillus. These cases showed the possibility of the prostate and seminal vesicles carrying the typhoid organism and reinfecting the urinary bladder thereafter. We know that the seminal vesicles and the prostate are prone to carry for years other organisms, such as the gonococcus, the staphylococcus, etc.

Dr. F. W. Robbins, Detroit: Three things I want to say. The first is to congratulate the society on this symposium, which to me has been most interesting. The second is to try to emphasize what Dr. Koll has said about the relation between chronic epididymitis and tuberculosis of the epididymis. I have seen cases of that kind that gave me a good deal of unhappiness for some length of time, and others in which after being as careful as possible I have come to the conclusion that tuberculosis was not present, but chronic epididymitis. I have noticed that most all books on urology have mighty little to say about chronic epididymitis. In regard to operations on the vesicle, to my mind it is often so difficult to separate entirely prostatic from vesicle conditions that I am sure I make mistakes sometimes, and I think if I operate on the vesicles when I think they ought to be operated on, I once in awhile won't get improvement because the trouble primarily is in the prostate.

Dr. H. L. Kretschmer, Chicago: I was glad to hear Dr. Belfield's remark about relapses after epididymotomy. In the large number of articles on epididymotomy one reads the statement that relapses do not occur; that they cannot recur. I have not seen as many cases as Dr. Belfield, but I have seen two cases, operated elsewhere, in which the patients had a relapse on the same side after the epididymotomy. Another had a bilateral epididymotomy with recurrence on one side. I think

both Dr. Koll and Dr. Robbins made welcome statements. A great many times I have had trouble in making a differentiation between epididymitis and tuberculosis of the epididymis. I am glad I am not the only one who cannot make it. I think the point of Dr. Koll as to prognosis is significant. To say to a patient that you have operated for tuberculosis of the epididymis, or that he has such trouble, is putting something over him which is not very pleasant. With Dr. Robbins I believe whether we do a vesiculectomy or a vesiculotomy, the remnants in the prostate must receive due consideration. The illustrations so ably presented by Dr. Smith have impressed me with this query: Will vesiculotomy cure these patients? Personally I doubt it. If we are going to subject these patients to operation it should be a vesiculectomy.

Dr. E. O. Smith, Cincinnati: The subject of calculi in the seminal vesicles has been referred to. I am sorry that Dr. Lewis is not here to give us his observations on the subject, for the reason that in the large number of these postmortem specimens that I have examined and in the limited number of vesiculotomies I have performed, no calculus has been found. There is no reason why they should not be there. They are frequent in the gall bladder, but we are still looking for them in the seminal vesicle.

The question of where we shall draw the line between patients who should be operated on and those who should not be operated on is of course still in dispute. After some little experience in a surgical way, I would not undertake a case unless it presented pus or chronic arthritis, and then only after all other methods had been used and had failed. Last May we had a case that Dr. Keller saw us do a drainage operation on. The patient had had all kinds of treatment for a period of three years. One year of this time he was in my hands. His experience before the operation was like this: He had frequent nocturnal emissions, as many as three in a night, and as many as five nights a week. This was not pleasant or satisfactory to him, so he would go out once in awhile, even with this excessive drainage, and have intercourse. After each intercourse he would have free, copious discharge of yellow pus from the urethra. We decided to drain him and are pleased to report that the patient has had absolutely no trouble since—no abnormal frequency of emissions and no pus. We believe that the time has been long enough to say that he is cured. In neurasthenic or impotent patients I would hesitate to operate as recommended by Fuller.

I think the slides I presented demonstrate conclusively that simple incision, particularly in the lower part of the vesicle, will do but little good. Most of the retained pus is found in the upper part of the vesicle, in saccules, all of which cannot be

drained by simple incision, but require multiple incisions.

Before doing this operation on a living patient, I did it several times on a cadaver, and would recommend this same preparation to any who contemplate vesiculotomies. The male perineum is a complex anatomical structure in which one can easily lose his bearings.

The position of the patient is important. He should be in the extreme lithotomy position, the knees well flexed on the abdomen. In this position the perineum is put on the stretch and dissection is more easily made without damage to the rectum or bladder.

Dr. R. W. Staley, Cincinnati: I am afraid we are getting mixed up about epididymotomy. The contention seems to be that in endeavoring to drain the pus pocket in the epididymis, there is danger of entirely severing one or more convolutions of the vas, thus bringing about a one-sided sterility. Epididymotomy is a delicate procedure and one should not haggle and blunder around indiscriminately or the continuity of the vas will be destroyed sure enough. The main feature of the operation is the incision of the tunica for the relief of tension. All intraepididymal probing should be done with blunt instruments. Recurrences of epididymitis in organs which have had the operation seem to me to point to one of two things; either the drainage was not thorough enough and a focus of infection was left which later on flared up, or else reinfection from the vesicle or posterior urethra occurred which would tend to prove that the integrity of the vas had been preserved.

Dr. W. T. Belfield, Chicago: The branching culs-de-sac or diverticula of the seminal vesicles, shown in Dr. Smith's photographs and in Roentgenograms of the injected vesicles that I have published, explain many failures to eradicate non-tuberculous infections of the vesicles by massage, even by vasostomy and vesiculotomy. It can hardly be expected that a simple incision into the lower end of the vesicle will drain and clean these culs-de-sac of the upper part. Hence, it would seem that after the failure of massage and of vasostomy has been demonstrated in a given case, further operative therapeutics should contemplate the excision, rather than the incision of the vesicle. Whether this is surgically wise must be determined by larger experience.

Dr. Louis E. Schmidt, Chicago: In reference to what Dr. Lower said about excising the vesicles, in some instances it is probably the correct procedure, but not in all instances, because many vesicles are tubular. Then a fair percentage are connected with diverticula. In both instances this morning I opened up the fascia, opened the vesicles and put the forceps into the vesicles showing that they were like a tube and not convoluted. There have been instances in my experience in which it

has been absolutely necessary to open the fascia, expose the vesicles thoroughly and make incisions into the vesicles and into the diverticula, as has been advised.

As far as the results of vesiculotomy and vesiculectomy are concerned, I think the reports of Fuller and Squier, and I know particualrly my own, are not of such a character as to make me believe, or anybody else believe, that it is going to be a universal operation. But if after routine treatment, then vasostomy, and you are positive the vesicle is the real focus, I am under the impression that it is desirable to consider the operative procedure on the vesicle. So far as the details are concerned, there will vary in individual cases. I agree with Dr. Belfield in removing the vesicles if the wall is particularly well infiltrated or if you are dealing with a vesicle of a type in which drainage is not sufficient. But if you open a pseudo abscess or drain an abscess of any kind for a definite length of time, it certainly gives opportunity for resorbing of the deposit and the making of a recovery.

Dr. E. O. Smith, Cincinnati: Mr. Chairman, I believe I express the sentiment of all the guests when I say we would like to extend a vote of thanks to the Chicago Association for the most excellent manner in which they have taken care of us.

A motion to this effect carried.

THE BIO-CHEMISTRY OF THE GONOCOCCUS IN ITS RELATION TO IMMUNITY.* **

By Carl C. Warden, M. D., Ann Arbor, Mich.

Gonococcus substance as obtained from culture yields on analysis about 12 per cent. nitrogen, or the equivalent of 75 per cent. protein, about 20 per cent. fat, together with phosphorus, sulphur, salts and ash. The analysis varies somewhat with the amount of water contained in the sample, and the character of the medium on which the germs are grown. Washing invariably removes nitrogen and fat, and it is probable that the presence of carbohydrate in the medium increases the quantity of fats.

The gonococcus possesses at least three enzymes, one proteolytic acting best in an alkaline medium, another hydrolytic, splitting dextrose, and another, a lipase which hydrolyses fats. Each, doubtless is reversible in action. These enzymes vary in amount with the medium employed for culture, the sugar splitting ferment, for example, being increased in the presence of dextrose.

The body of the gonococcus is exceedingly soft, easily injured mechanically and very pervious to water. The limiting membrane must be extremely delicate and contain little or no protective substance of waxy or fatty nature, since the Gram stain is invariably lost. This organism, with the meningococcus, appears to stand in body hardness at the extreme end of the coccaceae family whose most hardy members are found in some of the varieties of staphylococcus. The gonococcus contains practically no cholesterol-like substance (phytosterol) of which the hardiest and best protected organisms like the tubercle bacillus contain large quantities.

It has long been a matter of common observation that gonococci, or meningococci, after having been suspended in water or salt solution, ultimately disappear entirely,—in other words undergo what is known as autolysis, unless preserved by heat or chemicals, as in the preparation of vaccines. This "habit" of autolysis is the most conspicuous and constant feature of these organisms. The mechanics of autolysis is at once very simple and highly complex; simple in that it is always set in motion in presence of excess of water, whether the excess be in culture medium, *in vitro*, or in animal body fluids, —complex in the number of factors at work. Of these factors may be mentioned alterations of surface energy leading to edema and rupture, the catalytic effects of H and OH ions in the excess of water, of amino acids derived from the cocci them-

*Read at the Joint Meeting of the Chicago Medical and Urological Societies, January 5, 1916.

**From the Hygienic Laboratory, Univ. of Michigan.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, April, 1916.]

selves, and of enzymes. The process is hastened by moderate temperatures, up to 60, and by alkalies, and is checked by extremes of temperature and by mineral acids. Autolysis of the gonococcus is accompanied not only by disintegration of the body of the coccus and liberation into the menstruum of its products of metabolism, but also by hydrolysis, a chemical splitting of its components, especially its protein, so that there may be observed in the fluid at one time or another proteoses, peptone, amino acid and so on through the list of nitrogen derivatives to NH 3, (ammonia). The rapidity and completeness of the process depend in a measure upon excess of water, temperature, time, enzyme concentration, etc. In the sera of laboratory animals and man a suspension of gonococci undergoes autolysis and at the same time induces, by colloidal absorption, toxicity in the sera in a manner similar to other colloids. An aqueous or normal salt suspension of gonococcus behaves, physically, as a colloid with an electro-negative sign, and is flocculated or agglutinated by electrolytes of opposite sign, and by other colloids, such as serum, under certain conditions.

Clinical experience with gonococcus infections has demonstrated that the treatment of the disease by vaccines as ordinarily prepared is disappointing. From some of the above facts it may be inferred that such vaccines may not contain the germ substance as it exists when alive in culture or in the body, or in a condition to induce antibody formation by subcutaneous injection. This supposition is in part supported by the fact that the administration of vaccine or antigen does not produce in the serum of the patient or normal individual such substances or antibodies as will, in the presence of antigen, fix complement. In other words the administration of a dose of vaccine does not produce a positive complement-fixation test. With these ideas in mind I endeavored to improve gonococcus vaccines by first cultivating the cocci free from autolysis and subsequently suspending them in a non-autolysing menstruum. I found that in anhydrous substances such as pure glycerol and oil the cocci could be kept alive for a considerable period and preserved intact indefinitely, but my experiments on animals and man with these stable vaccines, with both alive and dead organisms, showed them to be no more curative or antibody forming than the old. Live and dead organisms alike promptly underwent autolysis in the body fluids following inoculations. The injections led to severe local reactions amounting, in some instances, to sterile necroses and to general symptoms to be classed among anaphylactic phenomena.

It was assumed from the foregoing that the gonococcus substance, presumably its protein, which we have regarded as the antibody producing substance, or antigen, is not available either in association with the disease itself—there being practically no im-

munity conferred by an attack—or by the methods of vaccine administration as we know them. I had, therefore, to approach the question from a different side. In examining various suspensions of gonococcus, vaccines, laboratory and commercial "antigens," etc., it appeared that while the nitrogenous content varied widely, other substances liberated in autolysis appeared to be more stable. These were the fats, their esters and acids. To determine whether they exercised a function in the phenomenon of complement-fixation I separated the fats as wholly and carefully as possible from the gonococcus substance, and, dissolving the product in absolute alcohol, used the solution as antigen in the test. The results of several hundred tests showed the solution to give a higher percentage of positive reactions, and with less fluctuation, in gonococcal infections and suspected cases than the watery antigens of commerce, while in no instance was a positive reaction obtained with the serum from a normal individual or from a patient with disease other than gonorrhea. At this point it may be said that the question whether such antigen may or may not contain small amounts of protein, nitrogen "rests," need not at the present concern us. It was inferred from the experience above stated that the complement binding power of watery antigen was due, at least in part, to the presence of similar fatty substances.

The next phase of the problem involved determining whether the injection of the lipoidal antigen into the body would exert any influence on the course of the disease, and whether injection into a normal individual would lead to fixation of complement. Neither of these questions has been fully worked out. All that can be said at the present time is that with doses not exceeding 15 mg. the lipoidal substances, injected subcutaneously in oil, have shown a decided influence in shortening the attack, while in the early stages of acute attacks and in the chronic stages their influence has often been immediate. A discussion of the role of gonococcus fats in immunity will be referred to a later paper.

GONORRHEAL COMPLEMENT FIXATION TEST.*

By V. D. Lespinasse, M. D., Chicago, Ill.

This test, developed clinically by Swartz and McNeill, is a real Bordet and Gengou phenomena. The technique of the test requires a few minims of blood serum; it is best to obtain from one to five c.c. of blood in a sterile test tube, let it stand over night and in the morning the serum is avaliable. Any hemolytic system can be used. The antigen used is autolized gonococcus bodies, or perferably the fats extracted from the gonococcus according to Warden's method. The test in its essentials is carried out in the same way as a Wassermann reaction.

The test appears in from three to six weeks after the onset of the disease. In very mild cases, where the involvement is limited to the anterior urethra, or to a small portion of the anterior urethra, the test may never appear. The metastatic complications of gonorrhea give the highest percentage of positive reactions. Chronic posterior urethritis, prostatitis, seminal vesiculitis, all give the test in a goodly percentage of cases.

The clinical value of the test is considerable; it is less than the value of the Wassermann reaction, but in certain types of cases it is indispensable. It is the only method by which we can tell whether a given attack is a newly acquired infection, or is an acute exacerbation of an old trouble. This is determined in the following way: Blood is taken and the test made, say one week after the onset of the discharge; the test comes positive, and we know then this attack is an acute exacerbation of an old infection, for the simple reason that one week is too short a time for sufficient antibodies to be developed in the blood serum to give the test. The test should be made on all candidates for marriage, when of course we expect to obtain a negative. If the test comes positive and is confirmed by another positive, then we should examine our patient very carefully for concealed foci of infection, which if found should be treated and the patient denied marriage until the test becomes negative.

The gonorrhea complement fixation test is entirely different from the Wassermann test in relation to treatment. As is well known, the Wassermann reaction can be changed, temporarily at least from positive to negative by appropriate treatment. Treatment cannot directly affect the complement fixation test. Authors differ as to the effect of gonococcus vaccine upon the test; some state that gonococcus vaccine will not produce a positive test —this, to my mind is wrong and cases which have been treated with gonococcus vaccine should not be

*Read at the Joint Meeting of the Chicago Medical and Urological Societies, January 5, 1916.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, April, 1916.]

examined for at least three months after the last dose of vaccine.

The autibodies of the gonococcus persist in the blood stream for from two to three months after the death of the last gonococcus.

The errors in the gonorrhea complement fixation test arise chiefly on the negative side. We obtain a negative reaction, when we know by other methods of examination that gonococci are present and growing in the body; we practically never obtain a positive test in any disease that is liable to be mistaken for gonorrhea clinically.

Conclusions.

The gonorrhea complement fixation test is of great value in the diagnosis of some phases of gonorrhea.

The test errs on the negative side more than on the positive. A positive result means gonorrhea; a negative result means nothing.

Like all laboratory tests, the test should be given its full value, but it should not be overly estimated, or under any circumstances be considered absolute.

COMPLICATIONS OF ACUTE GONORRHEA IN THE MALE.*

By Robt. H. Herbst, M. D., Chicago, Ill.

One of the early complications of a gonococcus infection in the male urethra is phimosis. This condition is usually observed in an individual possessing a redundant foreskin and in whom the inflammatory process is severe. In these cases there is usually a co-existing edema and swelling of all the tissues of the penis. This condition should be treated by frequent prolonged bathing of the entire penis in hot boric acid solution. Should this method fail, after diligent trial, and the phimosis be so severe as to prevent local treatment to the urethra, circumcision is indicated.

The old doctrine that circumcision in the presence of infection is contraindicated has been revised, and today we recommend circumcision in cases of phimosis when the condition cannot be relieved by simple methods, such as hot bathing.

The old Roser dorsal split, although a simple means of relief, is usually followed by poor cosmetic results. The Hotentot apron which remains, following this operation, has often to be removed at some later time.

Lymphangitis of the penis with a subsequent adenitis of the inguinal glands is sometimes seen in highly acute inflammations; usually subsiding with rest and hot applications. The inflamed inguinal glands rarely suppurate. Should these glands undergo suppuration, incision and drainage are indicated.

Paraphimosis is a condition where we find the prepuce caught behind the glans penis and like phimosis is usually found in severe cases of gonorrhea. If hot bathing prevents reduction, splitting of the contraction ring with removal of the foreskin should be recommended.

Infection of some of the follicles of the urethra participates in practically every gonococcus infection. In cases where the ducts of one or more of these follicles become obstructed we find the development of an abscess, the condition known as peri-urethral abscess. These abscesses gradually enlarge and when not interfered with, rupture either externally or into the urethra. Incision or external rupture when possible should be avoided, to obviate the possibility of a resulting fistula. This can frequently be prevented by incising the abscess in the urethra with the aid of the urethroscope.

Chordee, a complication which often adds greatly to the discomfort of the patient, is caused by infiltration of the corpus spongiosum. Hot or cold

*Read before the Joint Meeting of the Chicago Medical and Urological Societies, January 5, 1916.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, April, 1916.]

bathing of the penis with sedatives to prevent erection, as a rule, relieves the condition.

When the infection spreads to the floor of the bulbous urethra the ducts of Cowper's glands soon become infected, with a later extension into Cowper's glands. The inflamed glands can usually be palpated in the perineum on either side of the median line. These glands may merely enlarge and become tender or they may go on to suppuration. In some instances it is necessary to excise them or, when they break down, to incise and drain.

In at least 60 per cent. of all gonococcus infections of the male urethra, we find the process extending to the posterior urethra about the tenth day or shortly after. This invasion spreads to the edge of the trigone which is the limit of the columnar epithelium and commonly the limit of this infection; because as is well known, the gonococcus usually selects the columnar type and for this reason the bladder mucosa, being of the squamous type, is rarely involved. The condition, commonly termed gonorrheal cystitis, is in reality merely an involvement of the trigone producing symptoms of frequent and imperative urination, a symptom-complex often wrongly attributed to inflammation of the bladder mucosa. It is my belief that gonorrheal cystitis rarely occurs except in cases where there has been a pre-existing trauma of the bladder.

The prostatic follicles just adjacent to the prostatic urethra are usually infected when the gonococcus invades the posterior urethra. Not infrequently this process extends into the deeper recesses of the gland producing what is termed parenchymatous prostatitis. This condition is signalized by an increased desire to urinate, pain in the perineum, chills and temperature. These symptoms as a rule are promptly relieved by rest in bed, applications of heat to the perineum, and the introduction of an opium suppository into the rectum.

With the appearance of abscess of the prostate, symptoms of acute prostatitis are intensified. Upon the introduction of the examining finger into the rectum a large fluctuating mass is felt. Sometimes these abscesses rupture spontaneously into the urethra. When the suppuration develops toward the rectal side of the gland, incision and drainage are indicated. This may be accomplished by making an incision through the gut wall or by making a perineal section, dissecting up between the bladder and rectum until the abscess cavity is reached.

It is my belief that the gonococcus rarely infects the posterior urethra without first invading the ejaculatory ducts and seminal vesicles. If we bear in mind the anatomical relation of these parts, viz., that the ejaculatory ducts open on either side of the utricle, the place where we usually find a raging inflammatory process, it is difficult to conceive how these organs can escape infection. This contention is also borne out clinically. It is these very ducts and vesicles which are responsible for

the prolongation of many urethral discharges. In the past we have given all our attention to the treatment of the urethra and have sadly neglected the genital tract in infections of this character. I am satisfied that the seminal vesicles frequently feed the urethra with gonococci. Striking examples of this condition are the cases which give us a history of discharge from the urethra following practically every sexual exposure with a short period of incubation, often within 24 to 48 hours. In other words the urethra is infected by the gonococcus laden serum. These patients not infrequently have chocolate colored seminal discharges due to admixture of blood with the semen. Cases of acute seminal vesiculitis rarely heal spontaneously, in the vast majority the infection persisting until the vesicles are either directly medicated or incised and drained. Vasostomy followed by injection of collargol will clean up many of these cases. Vesiculotomy and drainage of the vesicles should be reserved for those cases in which there is a stricture high up in the vas, necessarily preventing any solution reaching the vesicles.

Abscess of the seminal vesicles develops in those cases in which there is an accumulation of pus within the vesicles which cannot drain into the urethra owing to occlusion of the ejaculatory duct due to inflammatory swelling. The diagnosis can as a rule be readily made by rectal examination, the swollen fluctuating vesicle being easily palpated. Given an individual with abscess of the right seminal vesicle, the necessity for differentiation from appendicitis may arise. Following rectal palpation, the condition described above being found, the diagnosis of appendicitis is readily ruled out. These abscesses rarely evacuate into the urethra and it is frequently necessary to practice incision and drainage; and as with prostatic abscesses this may be accomplished by making an incision either through the gut or by a dissection through the perineum.

Acute epididymitis, a rather common complication of gonorrhea is not a metastatic infection, but is caused by gonococci passing from the seminal vesicles to the epididymis by way of the vas deferens. The symptoms are those of an acute inflammatory process, viz., pain, swelling, tenderness and rise of temperature. Upon examination of the scrotum a mass is felt behind the testicle, while the body of the testicle, in most instances, is not involved. There is not infrequently a coincident effusion into the sac of the tunica vaginalis. The cord is greatly thickened and is tender and painful along its entire course. The diagnosis from other infections of the epididymis does not as a rule offer any difficulty. Although the signs and symptoms of acute pus infection of this organ are the same as those caused by the gonococcus, nevertheless we have the pre-existence of the gonococcal infection of the urethra to help us in making the

diagnosis. The differentiation from tubercular epididymitis offers little difficulty if we bear in mind that this process comes on in a slow, insidious manner, as a rule without pain and usually developing in the upper pole of the organ while the gonococcus infection always invades the lower pole first.

The discharge from the urethra generally ceases temporarily when the epididymis swells. This is possibly due to the auto-vaccination caused by the oncoming of the acute process in the epididymis. The discharge recurs when the swelling of the epididymis begins to subside.

Treatment.—It is well known that some patients complain of pain in the inguinal canal and have swelling of the cord many hours before involvement of the epididymis. If at this time an incision is made in the vas deferens midway between the upper pole of the epididymis and the external ring the involvement of the epididymis may be prevented. In mild cases of acute epididymitis, elevation of the scrotum by means of a well-fitting suspensory and the application of a solution of guaiacol in olive oil, 1 to 4, will usually give the desired relief. If this fails the patient should be put to bed with the scrotum elevated by means of a sling and the entire scrotum and inguinal region covered with a hot compress moistened with saturated solution of magnesium sulphate.

In very severe cases with enormous swelling of the epididymis, severe pain, high temperature and signs of fluctuation, incision and drainage are indicated.

The incision may be made in the median line posteriorly and the epididymis opened without entering the sac of the tunica vaginalis. In cases where we are dealing with a hydrocele and have reason to believe that there is an invasion of the tunica vaginalis, it is well to make the incision on the side of the scrotum so as to open the sac as well as the epididymis. In every instance where we are dealing with an infected epididymis we must necessarily have a pre-existing infection of the vas and seminal vesicles. Therefore at the time that the incision of the epididymis is made the vas should be picked up, opened and the vesicles injected through this opening with collargol. By so doing the entire seminal duct is taken care of and the common recurrent infections of the epididymis prevented. In my work the use of vaccines and serums has been of very little value in the treatment of gonococcal infections, although I have noted some beneficial results in the toxemias.

VULVO-VAGINITIS IN CHILDREN.*

By Isaac A. Abt, M. D., Chicago, Ill.

Gonorrhea in infants and children may occur not only in the female child, but it occasionally occurs in the male. It is not uncommon occasionally to meet with a case of gonorrheal urethritis in a child one or two years old or older. Occasionally gonorrhea occurs in the mouths of very young infants. Rodinski, many years ago, described gonorrheal stomatitis as occurring in new-born infants. One need hardly refer to ophthalmia neonatorum; but one may mention, in passing, gonorrhea as it occurs in the lower section of the colon or rectum. It is not at all unusual to find that infants and children are gonorrhea carriers, the infection having taken place in the lower segment of the bowel.

Gonorrheal vulvo-vaginitis, however, may occur in infants at any age, but more particularly in children three years old and over.

The mode of infection is familiar to all of us. The infection may be conveyed through the use of thermometers, utensils of various kinds, unclean linen, contaminated hands of nurses or attendants. The latter, in some instances, are supposed to be the carriers of the infection. We know, for instance, that when an infant or a child enters a hospital ward with a vulvo-vaginitis, it is only a very brief time until all the female children in that ward are affected with gonorrheal vulvo-vaginitis. This may seem an extravagant statement, but nevertheless it is true. When a child with this disease has entered a ward, it is almost impossible, even in the very best regulated hospitals, here or abroad, to limit gonorrheal infection. Statistics gathered from the very best New York hospitals, and from hospitals in this city, show, where children are taken into general wards, that this condition does prevail. Furthermore, we know that in our public schools not infrequently, vulvo-vaginitis is spread, either through toilets or in some other way that is difficult to divine. Public bathing places have been a means of disseminating the disease—for example, take the celebrated case reported from the City of Posen. In a public bathing establishment in that city, after the older girls, on certain days, had bathed, the little girls were sent to bathe, and within two or three days following bathing there was a widespread epidemic of vulvo-vaginitis.

There are interesting observations about the disease. Those of us who have seen a great many cases of vulvo-vaginitis, are impressed with the fact that very frequently the disease is mild, so mild indeed that attention is not directed to it except by the discharge. There is very little discomfort, or

*Read at the Joint Meeting of the Chicago Medical and Urological Societies, January 5, 1916.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, April, 1916.]

very little external irritation in the milder cases; and this raises a doubt whether this vulvo-vaginitis is in all cases a true Neisserian infection; but the best of authorities state that we should, at least, assume that the disease is Neisserian in character until better proof is furnished that the organism is not simply the gonococcus.

The symptoms in the severer cases consist of redness, swelling, inability to walk, difficulty in urination, and discharge.

It is true that complications are relatively uncommon. One is surprised at the fact that of the large number of cases of gonorrheal vulvo-vaginitis, the complications are few and far between. If one goes to the various hospitals and studies the records, he will notice very few complications. In a large number of cases recorded in the Cook County Hospital, only one case of secondary ophthalmia is found.

Again, gonorrheal sepsis in infants and children is relatively rare. This is amazing because we know children are very susceptible to sepsis of any kind. The infantile organism has a very low resistance against general infection. It is but poorly developed in antibodies. Once septic infection occurs in an infant, a severe septic process may be expected or is likely to develop; but it does not seem true of gonorrhea, and of the many cases I have seen I remember only one of severe gonorrheal arthritis, with endocarditis, followed by death. Nevertheless, gonorrheal arthritis does occur and manifests itself most commonly in the smaller joints, the joints of fingers and wrists; it is relatively uncommon, although not impossible of occurrence, in the larger joints.

Vulvo-vaginitis does not occur only at the introitus. It is a mistake to think that because the discharge is mild or is scant, and there is very little evidence of external irritation, that there may not be gonorrhea higher up in the vaginal canal. Rubin and Leopold have shown, by introducing electrically lighted instruments into the vagina in infants and children, that it was plainly evident the wall of the vagina higher up, and, indeed, the cervix and cervical canal, were not infrequently covered with a muco-purulent secretion, indicating that gonorrheal vulvo-vaginitis was not confined to the lower portion of the vagina, but that it may be present higher up on the cervix or cervical canal itself. Notwithstanding this, endometritis, salpingitis, and peritonitis are very rare complications, so that one may observe many cases before seeing any of these complications.

Other complications are inguinal adenitis, which is extremely rare, and enuresis which sometimes occurs.

The diagnosis in cases of vulvo-vaginitis is made by the abundant secretion, the redness, the swelling, etc. The older authors, men whose descriptions

were read twenty and thirty years ago, thought this flux was due to some dyscrasia or to some constitutional condition. They described the disease occurring as a complication of scarlet fever, measles, typhoid and various exhaustion diseases.

We must not assume that all cases of discharge from the vagina of infants are gonorrheal. There may be notable exceptions. For instance, a child that has aphthous ulcers in the vaginal portion, or that has infection of some other kind, may be easily shown not to be suffering from gonorrhea. On the other hand, pus, from the vast majority of cases, containing the intracellular diplococci is assumed to be of gonococcal origin.

Very recently a method of diagnosis has been suggested which seems to me to be very valuable, and especially in those cases where doubt exists. It has been suggested to examine the vaginal washings. Kolmer and Pierce have adopted the suggestion of Van Gieson, which consists of injecting into the vagina, with a soft rubber syringe, or with medicine dropper, one to four or five thousand bichlorid solution in normal salt solution, and thus allowing the vagina to be ballooned out slightly, and withdrawing again with the same syringe these washings, and in this way obtaining the secretion from all portions of the vagina, and obtaining also the epithelium of the vagina and the pus cells. This is centrifuged slowly for a number of minutes. submitted to staining reactions, and tested for gonococci.

It has been suggested, too, that in some cases where this method failed, it might be well to irrigate with mild nitrate of silver solution, and then examine the washings by centrifuging as I have just described. This method of diagnosis seems of considerable value.

Before we admit children into a general ward of a hospital, three vaginal examinations should be made and if all three are negative, then the children may be admitted into the ward.

In several years we have not had an epidemic of vulvo-vaginitis at the Sarah Morris Children's Hospital. Whether this is simply our good fortune or extraordinary care, I would not like to say until another period has passed. At any rate, we can congratulate ourselves that no epidemic has occurred.

As to treatment, my own experience relates particularly to the methods of irrigation, such as sitz baths. I have tried almost everything for irrigation purposes, and I have thought I had good results in some cases, while in others I have not. Some of these cases will get well in a few weeks and do not seem to have relapses. Others again, particularly in older individuals, will improve and relapses will occur. The disease sometimes is very intractable and the end does not seem to be in sight.

It has been suggested in some of the recent literature that the hymen should in some way or other

be scarified so as to prevent the secretion from flowing freely from the vaginal portion, or it should be destroyed under cocain anesthesia. It has been suggested, furthermore, to mop out the vagina with a strong argyrol solution, and then follow this with irrigations of permanganate.

In a series of cases that have been tested with various kinds of treatment by Hamilton of New York, he suggested that the best remedy he has found is Condy's solution. He gets better results in treatment with this solution than with any other method.

So far as the vaccine treatment in children is concerned, there are others who are more expert and know more about it than I do. I may say, however, that I have seen positively no results with the vaccines that have been placed in my hands.

PROSTITUTION AND GONORRHEA.*

By Lewis Wine Bremerman, A. M., M. D., Chicago, Ill.

To consider a subject of such magnitude as prostitution and gonorrhea in the short space of time which has been allotted to me, would be utterly out of the question, so I can only bring to your attention a few of the more important features so as to succinctly demonstrate the close relations which exist between prostitution and gonorrhea. This entire subject depends upon what is meant by the term prostitute.

If the strictest meaning of the term is considered we must define a prostitute as a *woman* given to indiscriminate lewdness for gain. I would rather omit the words "for gain," and emphasize the words "indiscriminate lewdness," so that the entire field of prostitution is covered including: The clandestine prostitute, the kept woman, and the married woman. Any one from these classes might prostitute herself without monetary gain. Even with the definition as above I am still rather inclined to find it incomplete as it leaves entirely out of the question that great army of infection bearers that exists in the "so-called cured" male prostitute. We should then define a prostitute as a *man* or *woman* given to indiscriminate lewdness. The male is not such an pernicious infection spreader as the female. Even at the outside one male would only infect a relatively small number of females, whereas the female may infect large numbers. I have known cases where females suffering with a virulent gonococcal infection would have intercourse with twenty men in one night, thus infecting large numbers of men. The female prostitute is the more dangerous to the greatest number and therefore some measures should be taken to *prevent her*, if you please, from wilfully spreading an infection which may be more widespread in its consequence than any other known disease. A few years ago I was asked to read a paper upon a similar subject but was unable to finish it on account of illness. Some of the statistics gathered at that time I will quote to show accurately from direct examination and careful questioning just how prevalent gonorrhea is among the commonly termed professional prostitute whose trade is not controlled by segregation or sanitary regulation.

These statistics were collected in New York shortly following the closing of the "red-light" district of that city. These women were considered to be the better class of prostitutes. I had planned to examine one thousand women, but only had the opportunity of examining 746. Of these 746, 100 per cent. had been prostitutes for over

*Read at the joint meeting of the Chicago Medical and Urological Societies, January 5, 1916.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, April, 1916.]

three years. These women ranged in age from 18 to 36, the majority being between 21 and 30. 702 of the 746, or 93 per cent., had gonorrhea or had been infected previously and only 44, or 7 per cent. negative cases denied all infection and had no evidence of such at the examination.

At the time of the examination 219 or 30 per cent. had microscopic Gram negative diplococci which were diagnosed gonococci without other clinical manifestations. These women were all plying their business and probably infecting a good proportion of the males with whom they were cohabiting. Twenty-nine or 11 per cent. had evidence of other venereal diseases and were likewise spreading infection. Sixteen or 2 per cent. had marked clinical symptoms and were not cohabiting at all according to their statement and would not do so until the discharge ceased. Not a single one told me that she would refrain from intercourse until she was proven to be free from disease by all known laboratory tests. Forty-five or 6 per cent. had been operated upon for, as they termed it, peritonitis, which no doubt was associated with a pyosalpinx of gonorrheal origin.

You will notice that my figures show very few active cases. I did not get the opportunity of seeing this type.

In my opinion sooner or later 100 per cent. of the women who enter prostitution or give themselves to indiscriminate lewdness will contract some of venereal disease. These infections are naturally contracted from the male. I have no doubt that the male spreads the disease not wilfully but through ignorance, believing himself to be cured when really there are still lurking somewhere in the genital tract active infectious organisms.

Men will not indulge, as a rule, in intercourse when they are suffering with the acute type of gonorrhea, knowing very well that such excitement will usually exaggerate and accentuate their symptoms which may terminate in grave complication. I believe thoroughly if the layman, yes, and the doctor as well, were instructed in the dreadful consequences of gonorrhea, that the condition is not cured when the discharge is stopped, and that many accurate examinations must be made prior to giving an opinion regarding the infectious nature of the individual, that the male would be decidedly more careful in exposing himself.

If the layman were cognizant of these things he himself would insist upon such examination and would necessarily demand that his physician be qualified to make it.

A few years ago a patient coming to us prior to his marriage for an examination to determine whether or not he had any of his old gonorrhea remaining was a rarity. A year or two ago there was produced a play called "Damaged Goods" which portrayed graphically the effects of venereal disease. Since that time hardly a week goes by

that we do not have a case or two come to us for such an examination.

There should be more such plays produced for layman and a wider propaganda of education along these lines which would be without question followed by great good. The social evil cannot in my opinion be overcome so long as there exists the differences in the sexes and the natural sexual instinct.

Prostitution should be controlled by segregation and by sanitary regulation which without question could reduce markedly the number of venereal infections.

My own statistics show that the majority of cases of gonorrhea have not originated from the professional prostitute who frequents a well-regulated house, and that gonorrhea does develop more frequently in the male who cohabits with the shop girl, the street walker, or the so-called "private snap."

The proprietors of well-regulated houses recognize the importance of keeping the girls who become infected from cohabiting until well.

If these houses could be under a well-regulated sanitary inspection the chances of contracting venereal disease would be reduced still lower.

The female prostitute, even though she is a social outcast should be protected as far as possible. She should be instructed at least to make such an examination of the male as would inform her whether or not there is urethral discharge. She should be instructed in the proper methods of taking care of herself, and by these precautions reduce to minimum her chances for infection. She should be instructed in the early manifestation of the disease so that she could immediately place herself under medical attention.

A severe penalty should follow if women who are known prostitutes, practice their trade when they are infected.

To summarize: I feel that segregation with strict sanitary regulation together with the education of the lay people regarding sex matters and venereal disease would reduce to a marked degree the present terrific and wide-spread infections of this character which are more damaging to the human race than any other disease, even including tuberculosis and cancer.

GONORRHEA AND MARRIAGE.*

By Irvin S. Koll, M. D., F. A. C. S., Chicago, Ill.,
Professor Genito-Urinary Surgery, Post-Graduate Medical School; Associate Genito-Urinary Surgery, Michael Reese Hospital.

The question of the marriage of gonorrheics should occupy the most serious consideration of the entire medical profession. It is amazing to know, however, how little knowledge the average man in general medicine has regarding the length of time a patient who has had a gonococcal infection is a source of danger to the female. Yet I am sure that every man in this gathering knows of more than one case where the honeymoon was abruptly ended by the bride falling a victim to the ravages of the gonococcus, with sterility and invalidism resulting.

The discussion, then, of this point in our symposium resolves itself into the consideration of the persistence of the gonococcus in the male genito-urinary organs. Under this caption, Edward L. Keyes, Jr., four years ago stated that he had "never known the gonococcus to persist in the male urethra for more than three years, while in at least ninety per cent. of cases it disappears with or without treatment within a year." This statement from one of the keenest of observers, of the widest experience, should be taken for just exactly what is means. But what about the remaining ten per cent. in which the gonococcus persists for more than one year?

I believe that most of my urological colleagues will concur with me in general with the rules laid down to candidates for matrimony who have had gonorrhea.

If the infection was limited to the anterior urethra, which is determined from the clinical history, and every evidence of the disease has disappeared, one year must have elapsed from the time of the last evidence of the infection before consent is given for marriage. The patient is then put through a series of tests, to be described presently.

If the pathology extended into the posterior urethra, thereby involving the prostate and vesicles, more or less, then two years must elapse following the final clinical disappearance of the disease, and the laboratory tests remain negative.

Instrumentation, alcohol test, and strenuous physical exertion are tried. The patient is furnished with slides upon which any morning discharge is placed, which is carefully examined. The first urine is collected, centrifuged and examined bacteriologically. Cultures are made the following

*Read at the Joint Meeting of the Chicago Medical and Urological Societies, January 5, 1916.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, April, 1916.]

day from the discharge, urine and prostatic secretion obtained by massage. In some instances cultures are taken from the semen ejaculated into a sterile condom. The complement fixation test is by no means of the last importance, but I feel that up to the present our technique is not sufficiently developed to cause us to make any dogmatic deductions. I shall recur to this point immediately.

This is not the time to discuss the technique of the various laboratory tests, which are intricate and delicate, and give abundant opportunity for error in inexperienced hands, particularly in the interpretation of the bacterial culture. This is especially true since our attention has been called by Warden to the fact that many bacteria are wrongly diagnosed as the gonococci.

To revert now to the serum reaction, which can be considered but briefly in this connection:

I quote from Dr. Warden, who was kind enough to answer three questions I put to him:

1. "I believe it is possible to obtain a positive fixation test in the absence, so far as the evidence of smears and cultures goes, of the gonococci in the genito-urinary tract."

2. "I believe that in some cases, even when all clinical signs have been absent for years, a fixation may be obtained. A few instances of fixation as long as twenty years have been noted by other observers as well as ourselves."

3. "I should certainly withhold consent to marriage in the presence of a positive test, whether two years without symptoms had passed or no."

No one more than I recognizes the admirable work that Dr. Warden has done in this connection, but as he admits that it is possible to obtain a positive fixation in an individual clinically cured for twenty years, I am quite confident he would not deny that man on this test alone the privilege of marrying. Therefore, so far the serum test, in the opinion of the writer, is of no definite value in designating a cured gonorrhea, but every confidence is entertained for its future reliability.

In a final word, let me exhort, if I may:

1. The education of fathers interviewing their prospective sons-in-law to inquire into the condition of their genito-urinary tract, as well as into the condition of their bank accounts.

2. A more serious inquiry on the part of general practitioners into the gonorrheal history of their patients, by whom they are many times more frequently consulted than falls to the lot of the genito-urinary specialist.

25 East Washington Street.

TRANSACTIONS

Joint Meeting of the Chicago Medical and Urological Societies, Held January 5, 1916, With Dr. Herman L. Kretschmer in the Chair.

Papers were read as follows:

1. Bio-Chemistry and Bacteriology of the Gonococcus, by Dr. C. C. Warden, Ann Arbor, Michigan.
2. Complement Fixation Test, by Dr. Victor D. Lespinasse.
3. Complications of Acute Gonorrhea, by Dr. Robert H. Herbst.
4. Vulvo-Vaginitis in Children, by Dr. Isaac A. Abt.
5. Gonorrhea and Prostitution, by Dr. L. W. Bremerman.
6. Gonorrhea and Marriage, by Dr. Irvin S. Koll.

(All of the above named papers appear in this [April] issue of the Urologic and Cutaneous Review.)

Discussion of the Symposium on Gonorrhea.

Dr. Ralph W. Webster: There are certain points that have been raised especially by Dr. Warden and by Dr. Koll which I would like to discuss briefly, and particularly some of the earlier work of Dr. Warden.

As I recall the earlier papers of Dr. Warden, definite statements were made at the time which rather shocked me, but as I have studied the question later I have come to agree almost entirely with him. The first of these was the statement in the original paper of Dr. Warden in italics, so that none might miss it, that "Gram negative intracellular biscuit-shaped diplococci in smears were almost invariably shown on culture to be staphylococci." At that time this statement seemed rather startling, when we consider that every phase or every known earmark of the gonococcus was mentioned and the conclusion drawn when a culture was made from the pus containing the Gram negative intracellular biscuit-shaped diplococci, they were not gonococci.

Since that time it has been my good fortune frequently to examine smears and to compare these smears with cultures from cases of supposed gonorrhea. I must say that work done along these lines, which by no means makes any pretense to being extensive, confirms Dr. Warden's ideas fully, that is, in a smear, whether it be from a case of clinical gonorrhea, acute gonorrhea, whether it be from chronic supposed gonorrhea, or from a condition of

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, April, 1916.]

genito-urinary irritation with pus formation, we find this Gram negative intracellular biscuit-shaped diplococcus, but in the majority of cases the organisms grow very well on plain agar and upon other media upon which the true gonococcus does not grow. We must either accept the view that the gonococcus will not grow on plain agar or on other culture media, or we must give up our idea that the gonococcus is the only organism which shows the characteristics I have mentioned.

I believe the time is at hand when we must admit that a very large percentage of cases of genito-urinary infection are due to other organisms than the gonococcus, and personally my belief is that the organism which is the invader in a large percentage of the cases is the micrococcus catarrhalis which, up to the present time, has not found its way into the text-books to a great extent, but nevertheless, is one which I believe, personally, from work done in my laboratory, to be the organism which we must consider to a very large extent. I do not mean by this that we do not have typical gonorrhea, but I do mean that many people have been damned as gonorrheics when they were not such. This leads to the point mentioned by Dr. Koll as to whether all these cases should be amenable to the complement fixation test. If we assume that we must find in the urine or in the prostatic discharge, or in the urethral discharge, whether it be anterior or posterior, the specific organisms and consider them always gonococcic, it is rather hard to understand why we do not always get the complement fixation test. If we assume they are not gonococci, but some other organism, we can understand why the variation of the complement fixation test is so marked, and why the difference of opinion is quite distinct with clinicians.

There are several other points I would like to take up, but I do not feel I have the time to do so.

DR. ALBERT E. MOWRY: It seems to me, we should strive to come to a practical solution of this question and circulate pamphlets or devise some means to prevent venereal diseases and give advice to men who are going to marry who have had gonorrhea, so that they may not infect their wives.

We ought to publish little pamphlets in reference to venereal prophylaxis, and this can be done if we study the matter carefully and thoughtfully. We can get venereal prophylaxis so that there will be very little venereal disease disseminated.

We must consider this matter from a practical standpoint, because we are not going to reform the world for many years. When I think of the statement of Noeggerath, I am inclined to agree with him that "once a gonorrheic, always a gonorrheic," is not a great ways from the truth, in chronic cases.

In the army, when I was in the service as assistant surgeon in the Spanish-American War, many

men who had passed examination for army service with close scrutiny for latent gonorrhea and pronounced free of such would suffer with types of diarrhea and dysentery which irritated the deep urethra, so that it would set up a profuse discharge in which we could find plenty of gonococci.

The more I see of gonorrhea the more I realize that it is in the adnexa of the urethra, and we can almost figure we are going to have it for a great many years.

We should not forget that we are still trying to find a method to cure chronic urethritis and not put all efforts into experiments on chronic gonorrhea of the genital tract.

DR. J. S. EISENSTAEDT: The remarks of Dr. Abt in regard to the indefiniteness of cure of vulvo-vaginitis in children, and that some of them get well in a short time and others persist for months, remind me of the recent reports from Germany in the use of ethyl cuprein hydrochlorid, which was used originally against pneumococcus infection, but has been used over there in cases of vulvo-vaginitis in children with astonishingly good results by several reporters. I have made use of this in two cases in Chicago with distinct improvement, but the time has been too short to state definitely the ultimate results.

Optochin has been used with success in cases of gonorrhea in all stages, particularly in those cases which have proved refractory to the various silver salts. The drug has a peculiar dissolving capacity upon the capsule of the organism.

In regard to the statements concerning prophylaxis in the various armies, it is a fact that in our Navy the number of venereal cases has diminished very perceptibly. In one report of cases of men admitted to hospitals on account of venereal disease, it is said the number has decreased over 30 per cent. I am informed—I have not definite authority, and do not know how accurate the information is—that the secretaries of both the Army and Navy of the United States have decided to do away with prophylaxis, particularly in the Navy. Prophylaxis was considered extremely effective and efficient, and to do away with it strikes me as being very peculiar. This matter should be called to the attention of men who are interested in urology and venereal disease. Where we have in our hands a preparation, like 33 per cent. calomel, with the addition of thymol in lanolin, and 2 per cent. albargin, or a strong solution of protargol, which is a preventive against gonorrhea, I think such methods should be greatly encouraged.

DR. HERMAN L. KRETSCHMER: I should like to discuss briefly the paper of Dr. Herbst, who brought up the treatment of some of the complications of gonorrhea.

With reference to the surgical treatment of gonorrheal epididymitis, one frequently sees in the literature statements made relative to the value of surgical

treatment. Surgical treatment is of distinct value in such cases as it reduces pain, the temperature goes down within twenty-four hours, and the leucocytes diminish in number. I do not think, however, surgical treatment is of any value in the prevention of recurrences. I have seen three or four patients operated upon in this way, a typical epididymotomy being done, and yet these patients have had recurrences.

It is interesting to study the pathology in connection with the cases operated upon. In some cases one finds agglutination of the visceral and parietal layers of the tunica vaginalis. In other cases we find a large quantity of hydrocele fluid. Sometimes the sac of the tunica vaginalis is empty or contains just a few drams, while the epididymis and body of the testicle are covered with exudate.

I do not see the logic in Dr. Mowry's argument with reference to urination being a prophylactic when we know so many times the gonococci are harbored in the prostate and seminal vesicles, nor can I agree with the statement that "once a gonorrheic always a gonorrheic."

I should like to ask Dr. Abt to tell us the reasons why little children who are so susceptible to infections of various kinds do not have more infections from vulvo-vaginitis, particularly with reference to ophthalmia. These children cannot be instructed. I do not know why they do not have ophthalmia more than they do.

DR. C. C. WARDEN (closing on his part): A word in regard to complement fixation. Complement fixation in gonorrheal infections is apparently not fully and clearly understood. There are some peculiar things about it and some very embarrassing things, but I think eventually they will be worked out. As Dr. Lespinasse says, the reaction is not positive until from four to six weeks of the disease. If the reaction remained positive throughout the inflammation it would be of great value, but it is not so. If a case is observed periodically every few days throughout an attack of gonorrhea, or if several cases are observed periodically, it will be found at some time during the process of inflammation the reaction will be positive. Inside of a few days it will be negative, then a few days again it will be positive, and then later again will be found another negative, so that the reaction seems to proceed in waves. One negative reaction in complement fixation work is of no value; repeated negative complement fixations, particularly in the presence of one of the clinical signs of gonorrhea, are of great value. I believe a positive complement fixation test is invariably of value. There are peculiar cases which everyone has observed, where a positive reaction is obtained for thirty years after gonorrhea. These cases I do not believe have been worked out, although there may be cases where the gonococcus may be present in the body without any signs of the disease existing. This

applies particularly to children and to women, and the more I study the subject, the more I am convinced that in the female, and occasionally in the male, we find a condition where the individual is a carrier of the gonococcus, where the germs can subsist upon the mucous membrane without producing inflammation in that particular individual. I have seen several times in children and adult females the presence of the gonococcus by culture where there were no clinical manifestations at all. These cases have given rise to infections in the male, so that I believe this organism is no exception, that it follows the rule of other organisms, and that frequently we have carriers of the gonococcus just as we have carriers of the diphtheria bacillus and of other similar germs.

With reference to the question of diagnosis, I believe it is an error, particularly in women and in children, to expect to make a diagnosis from a smear alone, and this is particularly applicable in those cases where the picture is not clear, as in chronic cases. There are many organisms which may be confused with the gonococcus in smears, and unquestionably some of the children and a great many of the women have the stigma put upon them unjustly. There are many cachetic. anemic, strumous children in hospitals that have plenty of secretion from the vagina, and with repeated negative complement fixation, there is found to be an utter absence of the gonococcus.

The staphylococcus, as it appears in smears from the urethra, is extremely deceptive and cannot by any means be distinguished from the gonococcus. The gonococcus is not a diplococcus to begin with. It is a micrococcus, and like a great many of the cocci family undergoes division by splitting in the biscuit form.

In a publication some two or three years ago, in which I laid considerable emphasis upon the staphylococcus, I was severely taken to task by Eastern brothers, but there was no evidence brought forward to negative the assertion which I then made, that the staphylococcus, undergoing division and having the biscuit form in smears from any source, was indistinguishable from the gonococcus. What role the staphylococcus assumes in the inflammations in the later stages of gonorrhea I do not know. A smear from a case of acute gonorrhea, where the cells are full of cocci or *characteristic organisms*, in the utter absence of any other germ in the field, I accept without other clinical sign as being strongly indicative of acute gonorrhea, but I do not allow myself to be satisfied with that alone.

Sometimes we receive a smear from the case of a woman with the question, Has this woman gonorrhea or not? In that smear we will find a great number of bacteria, great numbers of all kinds of bacteria, all members of the cocci family, with bacilli and streptococci, and every manner of organism, and just because a few leucocytes may

contain three or four Gram negative intracellular organisms, to say the woman has gonorrhea is a mistake. I say to the doctor, I am unable to say definitely. If the laboratory man cannot tell, how am I to know?, the doctor may ask. By proceeding further using repeated complement fixations and cultures, and if a positive complement fixation or positive culture is shown the diagnosis is accepted.

With reference to segregation, I would favor ideal segregation which will keep the professed prostitute within certain bounds; but as to the examination of professional prostitutes, as these examinations are conducted in a great many cities, they are imperfect. I have one particularly in mind where the inmates come up for examination under police guidance. If those patients are shown to be positive they are thrown out of the house and upon the town. They apply for admission to hospitals, and are refused. Our municipalities care for tuberculous individuals, they are extremely careful of them, and the finest sanitaria are erected to house them; but the unfortunate individual with syphilis or with gonorrhea is an outcast.

I would be in favor also, in cases of gonorrhea and syphilis, of making these diseases reportable, so that they can be cared for and be under supervision as well as those of the professed type.

Dr. Robert H. Herbst (closing on his part): You have heard a great deal this evening about venereal prophylaxis, and very little has been said with reference to the cure of the disease. I judge many of you, as is also true of the laity, believe that gonorrhea, at least in the male, should be relegated to the incurable heap. I think this notion has developed because we as a medical profession at large have been devoting our attention to the treatment of this condition in the male largely to the lower urinary tract and have sadly neglected the genital tract where the gonococcus is harbored and carried to the marriage bed.

Let us briefly consider the pathology of the condition in the male after it has gone on for a number of months. If a man has a slight catarrhal discharge from the urethra, he may have infected lacunae; he may harbor gonococci in the follicles in the prostate gland or the seminal vesicles, and how much good will syringing with some fluid do in these conditions? That is the way the majority of males are treated for gonorrhea today. If we eliminate the condition of infection of the lacunae and give the bladder-neck cases the benefit of instillations and attack them surgically, if necessary, where the seminal vesicles and ducts harbor these organisms, we can do much good. Let us, for instance, drain the vesicles by vesiculotomy or make an opening in the vas and medicate with silver salts and collargol.

In regard to the operative treatment of epididymitis, I agree with what has been said that if

we simply incise the epididymis and drain it, we will see a recurrence of the disease. I am certain from my own experience that if we incise the epididymis, drain it, and take care of the rest of the genital tract, the vas and seminal vesicles, and inject some solution into the vesicles, we will not see cases of recurrent epididymitis.

Dr. Isaac A. Abt (closing on his part): I am very glad to have heard what Dr. Eisenstaedt has said with reference to the use of ethyl cuprein hydrochlorid having been successfully used in these cases of vulvo-vaginitis. We have used it hypodermically in severe cases of pneumonia and have had some favorable results.

Referring to the question of Dr. Kretschmer, I feel I will do best by simply saying I do not know, but the fact is and it is a striking fact, that there are so few complications, and there are so few cases of ophthalmia in the gonorrheal infections of infants. It seems strange that the organism should have a selective action for the vulva and vagina. Then, too, we know that once infection has taken place with this organism, the child sometimes prolongs the infection by manipulating the parts or, to be plain, by masturbation. The child rarely puts the fingers in his eyes, but he most often puts his fingers to his mouth, but very seldom is infection there. Why there are so few cases of ophthalmia, and why complications are so rare, I am at a loss to know.

Dr. L. W. Bremerman (closing on his part): That portion of my paper relative to the segregation of prostitution has brought forth some criticism, and I think to a degree some just criticism, but I think the criticism of my stand in this matter from Drs. Blount and Yarrows is absolutely unwarranted. I was not considering segregation from a moral or immoral standpoint, but from the standpoint of venereal infection. I am sure, those who practice genito-urinary surgery, or who specialize in venereal diseases, in taking the histories of their cases will find that the men who come to them infected with gonorrhea give a history to the effect that they have contracted the disease in a large proportion of cases from other than professional prostitutes. In Guiteras' recent book, he quotes Fournier, who states that of 387 men examined, they contracted gonorrhea as follows: From licensed prostitutes, 12 cases; private prostitutes, 44 cases; mistresses and actresses, 138 cases; working women, 126 cases; "private snaps," 41 cases, and married women, 26 cases.

This report of Fournier shows definitely that the licensed prostitute, from the standpoint of venereal infection, is much less dangerous as compared with the unlicensed prostitute.

I thoroughly agree with Dr. Blount that the male should be placed in the same class as the female, and *vice versa*. I tried to show that distinctly in my definition of a prostitute, including

both male and female. I still think that from the standpoint of venereal disease, segregation, properly and carefully carried out, with strict scientific examinations accurately made, is an excellent method in dealing with this problem. Scientific examinations are not those shown by Dr. Yarrows, consisting in a physician coming in once a week or once in ten days, after making a casual examination, giving the prostitute a certificate to the effect that she is free from venereal disease. She might have been free from venereal disease when the card was first made out, but may have been exposed any time during the interim. These examinations should be made carefully and scientifically; the discharges and secretions should be examined microscopically and culturally, and if the women are found to be chronic carriers of the gonococci, they should be segregated in hospitals where proper treatment may be carried out.

DR. BLOUNT: I would like to ask you, in the list you read, whom would you segregate? Would you segregate actresses and working women, or whom would you segregate?

DR. BREMERMAN: The question is a very pertinent one, and if it can be done, I believe that all of these women should be segregated as well as the men, but if we were to attempt to segregate all men who are carriers of the gonococci, I am afraid there would be very few left to carry on our daily vocations. It is a serious question and one which should be threshed out thoroughly and absolutely from a scientific standpoint. I believe that if the male is properly instructed in regard to knowing when he is cured, and the general practitioner or the doctor is so instructed that he can make these examinations properly, he could tell a patient when he is free from all infection so far as being a carrier is concerned, and that of itself would reduce to a marked extent the prevalence of gonorrhea. If men will not refrain from sexual excitation and must seek sexual gratification, let them seek those places where they are less liable to contract disease, namely, in licensed, well regulated, restricted sanitary districts rather than take the women of the street and cohabit with them, no matter whether they be actresses, mistresses, or working women.

SOME OBSERVATIONS ON PYELITIS IN PREGNANCY.*

By J. Clarence Webster, M. D., Chicago, Ill.

The study of pyelitis in pregnancy reveals a number of points worthy of special consideration. The literature on the subject is rich in inaccuracies, inexact statements and fanciful speculations regarding the various factors which are concerned in the production of the disease.

Regarding its frequency, available data are not thoroughly reliable. In the past there has been great lack of careful analysis in discriminating between the following classes of cases:

I. Those in which the disease occurs for the first time in pregnancy.

II. Those in which the disease in pregnancy is merely a continuance of that whch was known to exist when gestation began.

III. Those in which it is merely the redevelopment of a condition which existed at some period previous to pregnancy. This class is undoubtedly larger than is generally believed.

In many cases pyelitis may run such a mild course as to cause no symptoms and, therefore, to be unsuspected. In this latent condition there is a tendency to occasional exacerbations, which may occur in pregnant as well as in non-pregnant women.

In estimating the frequency of true primary pyelitis of pregnancy, therefore, it is quite evident that an almost impossible task is presented even to the most careful observer who attempts to make an analysis of a large number of cases. Are pregnant women really more prone to the disease than those who have never been pregnant? I am very sceptical on this point and in fact do not believe it. The disease is practically the same in pregnant women as in the non-pregnant. The same varieties of infecting organisms are found. What facts are indisputable as regards pyelitis in pregnancy, which is primary, as far as is ascertainable?

I. The disease usually begins between the fifth and eighth months of gestation.

II. The colon bacillus is the infecting organism in the great majority of cases. This is also true of non-pregnant women.

III. In the majority of cases the disease occurs on the right side, though it may be bilateral or limited to the left side.

Various speculations have been current regarding the special influences exerted by pregnancy in the production of the disease.

I. Obstruction to the flow of urine through the ureters. The normal relations of the ureters in pregnancy are very well known, owing to many

*Read at the Joint Meeting of the Chicago Gynecological and Chicago Urological Societies, March 17, 1916.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, May, 1916.]

elaborate studies of the cadaver by means of frozen sections. Both kidneys and ureters are subjected to the increase in intra-abdominal pressure, which becomes more marked after mid-term. The more tense the abdominal wall, the more marked is the pressure of the uterus against the posterior parieties. In a primipara it is greater than in a multipara. With a lax abdominal wall, the fundus of the uterus tends to fall forwards when the woman is erect. The more separated the *recti abdominis* muscles, the more marked is this tendency. The pregnant uterus is plastic and is readily moulded by structures firmer than itself with which it comes into contact. Normally, in advanced gestation, it is indented by the vertebral bodies and posterior half of the pelvic brim. The bowel with hard fecal matter or tense with gas easily makes an impression upon it.

Frozen sections show that this moulding may bring the uterus into very direct relationship with the ureters where they cross the pelvic brim in the hollow on each side of the promontory. It has often been stated that the ureters are protected by lying in these hollows. This is so in the case of certain hard tumors but not in the case of the pregnant uterus which is easily moulded and may thus press directly on the uterus. The pressure is increased the larger the fetus, the more abundant the liquor amnii and the more contracted the abdominal cavity. Granting these anatomical facts, we have absolutely no exact knowledge as to the frequency or degree of obstruction to the flow of urine in the ureters.

Dilatation of the ureter and renal pelvis may be found in pregnant women at autopsy or in abdominal operations, but the condition may have existed previous to pregnancy. There is no evidence whatever to show that gestation is an important factor in producing these conditions. R. Franz, of Graz, one of the most recent writers on pyelitis of pregnancy (*Medizinische Klinik*, Wien, 14 Feb., 1915), gives great importance to obstruction in the urinary flow (*Harnstauung*) as a factor in its production. Another writer, Weibel, states that 47 per cent. of pregnant women have some degree of backward pressure in the uterus. If this be correct and if Albeck approximates to the truth in stating that pyelitis occurs in only 0.67 per cent. of pregnant women, we cannot believe that interference with the urinary flow is of very much importance in causing the disease. Mirabeau and others refer to the hyperemia of the pelvic viscera which occurs normally in pregnancy, and believe that mucosal swelling in the bladder and ureter may be a factor in producing constriction and interference with the urinary stream.

Interference with the ureters, such as is produced by intra-pelvic swellings, *e. g.*, solid and cystic tumors and tubo-ovarian infective masses, in my experience, is comparatively rarely associated

with pyelitis. Moreover, in a very considerable percentage of cases of hydroureter, no pyelitis, whatever is found.

Of great importance, in my opinion, is the observation that in those cases in which there is the greatest intra-abdominal pressure, *e. g.*, primiparity, hydramnios, twin pregnancy, tumors and pregnancy there is no greater tendency to pyelitis than in other gestation cases.

The greater frequency of the disease on the right side has been widely believed. Yet, we must be careful about accepting statistics with regard to this point. Without ureteric catheterization, no one is competent to state in any given case of pyelitis whether one or both sides are affected. Because the patient has pain on one side only is no proof that the other side may not be infected.

Examination of the ureters *per vaginam*, while frequently valuable, is not sufficient to establish the location of infection. While in many cases of pyelitis the lower ends of the ureters are tender or thickened, in others this is not the case.

Various explanations are current in regard to the supposed greater frequency of pyelitis on the right side. Those who believe that interference with the urinary flow is an important factor refer to studies of ureteral dilatation such as those of Herzfeld. This investigator has tried to establish a different anatomical relationship between the ureters and iliac vessels on the right and left sides. He states that normally the ureters are somewhat protected at the brim by crossing the bifurcation of the common iliac. When the latter is abnormally high or low, there is more risk of ureteric compression. Normally, he states, the right ureter is more liable to pressure than the left, as it crosses the external iliac at a lower level and enters the pelvis at more of an angle.

This explanation seems to me entirely fanciful. I have been unable to ascertain any relationship of the ureter to the iliac vessels which can explain supra-pelvic hydro-ureter.

Franz is inclined to think that dextroversion or dextrotorsion of the uterus may explain why the right ureter is more frequently affected than the left. It has often been stated that the uterus rotates on its long axis as it grows in pregnancy, most frequently towards the right so that the left border is moved forward. In a long series of investigations made years ago I could find no proof of this. Rotation may be found but its frequency is unknown. Clinical determination of this point is not reliable, because the outline of the uterus cannot be sufficiently accurately determined in relation to the landmarks necessary to establish the degree of rotation. No doubt in many cases, conditions described as rotation have been only the moulding of the uterus on the fetus by the examining hand. Also. rotation has been described which has not been true or inherent, but only acci-

dental, due to displacement by distended bowel or bladder, or to that caused by old adhesions or cicatrices. In many cases rotation found in pregnancy is only the continuance of the condition which existed in the non-pregnant state. In any case, rotation or lateral deviation of the early months is of very little importance after the mid-term of pregnancy in determining pressure against one or the other ureter. Unless there is a very lax abdominal wall, no appreciable movement of the pregnant uterus in advanced pregnancy can take place, and then it tends to fall forward when the woman is erect.

One other explanation of right-sided pyelitis is that which attributes an influence to dilatation of the renal pelvis. As is well known, this is more common on the right side in non-pregnant women and has been associated with the greater frequency of mobility of the right kidney. It is believed that the existence of this condition may favor the development of pyelitis by micro-organisms.

Another explanation is that owing to the tendency of the right kidney to lie lower than the left, the former is brought into closer relationship with the colon and that the direct passage of colon bacilli through the tissues (which is undoubtedly the most important means of infection), thereby, more readily takes place on the right side. This sounds plausible, but is not satisfactory. If these anatomical relationships exist, they are found only in the early months of pregnancy, when pyelitis rarely develops. In the late months of gestation the large intestine is pushed upwards and is in as close relationship to the left as to the right kidney.

Regarding the influence, origin and mode of entrance of the infecting organisms in pyelitis, there is some difference of opinion. That they may act without any previous urinary obstruction in the ureters is, of course, certain. That hydro-ureter may be secondary to infection is also established. This is particularly marked when the lower end of the tube is infiltrated with tuberculosis, but it may be due to the activity of other organisms. Colon bacilli are the most common cause of pyelitis. Streptococci, staphylococci, gonococci and tubercle bacilli and other organisms are less frequently found. In some cases more than one variety may be found. The following views are held regarding the invasion of the pelvis:

1. Entrance from the vulva through urethra, bladder and ureter—probably rare.

2. Passage from an infected bladder through the wall into surrounding lymphatics and thence upwards along the ureters to the kidney pelvis. This has recently been urged by Bauereisen. This is difficult to prove and must be rare.

3. The most common source is undoubtedly the large intestine. From it the colon bacilli may pass in local disturbances, *e. g.*, ulceration, catarrh, and probably constipation, and possibly in generally

weakened conditions. Thence the organisms may enter the blood and be carried to the kidneys, or they may pass directly towards the kidneys through the lymphatic connections between them and the large bowel. When pyelitis has developed it may be limited to the pelvis and upper ureter, or may extend throughout the entire length of the latter. The bladder may become involved but frequently it is not infected or only to a slight extent.

4. That distant focal infections, especially those due to streptococci and staphylococci may cause pyelitis by blood transmission is very likely, though definite proof has not been established. I have had one case in which an infection of throat and nose was followed by bilateral pyelitis, the same organism, a streptococcus, being obtained from both diseased tracts.

The symptoms and signs of the disease are the same as in non-pregnant women. In some cases the patient may complain only of malaise and slight fever, without any pain. The fever may be high and may be accompanied with chills. There is often aching in the loins. Frequently attention is first called to a pain in the affected side, accompanied by fever, nausea or vomiting; it may be anywhere along the urinary tract. In some cases there is frequency of urination. Rarely is there actual bladder distress, except where this viscus is involved. When the disease occurs on the right side, the pain may simulate that found in appendicitis or even in gall bladder disease. Serious mistakes have been made in diagnosing these cases as appendicitis, cholecystitis and adnexal disease and in opening the abdomen for the relief of the condition. During one month, a few years ago, I was asked to operate several times for appendicitis in pregnancy after the sixth month where acute pyeloureteritis alone existed. In each instance vaginal examination had not been made and urinalysis had been neglected. In all cases these two procedures are of the greatest importance. In many there is very definite tenderness along the lower portion of the affected ureter which may be so thickened as to be readily palpable. The most marked outlining of the ureter occurs when a stone is impacted and surrounded by fibrin and in tuberculous infiltration. In the urine there is albumen and pus, epithelium from the pelvis of the kidney or ureter. In some stages red blood corpuscles are found and when the true kidney substance is involved, there may be considerable serum albumen and casts. The quantity of urine tends to be decreased and its specific gravity increased. Microőrganisms are usually abundant except possibly in the very early stage of the disease, and of course variations are found from time to time in long protracted chronic cases. Cystoscopy and ureteral catheterization are rarely ever necessary to establish the existence of the disease but may be helpful if it be thought important to determine the extent of the urinary tract involved.

Treatment.

The treatment of pyelitis is the same in pregnant as in non-pregnant women. It is important that it should be thorough and careful, so as to modify the disease as much as possible, lest any serious development should occur which might cause premature labor spontaneously, or call for its induction. In severe pyelitis there is undoubtedly an increased risk of this complication. In the case of labor the risk of uterine infection from the urine is considerable.

Details of treatment need not be fully specified. They fall under the following divisions:

1. Rest in bed in the early stages.
2. Soft diet, non-irritating to the kidneys, with free liquids.
3. Administration of urinary antiseptics.
4. Vaccine.
5. Local applications through the cystoscope and ureteral catheter.
6. Surgical.

Of these the most widely employed are the first three and they suffice for a large percentage of cases. With the best of care, while it is rare that marked pyonephrosis results, a considerable percentage do not recover completely but continue the disease in a chronic form, though usually mild and subject to exacerbations.

Autogenous vaccine treatment, while apparently often helpful, has been on the whole disappointing. It is utterly valueless in very chronic cases, especially where marked changes have occurred in the upper ureter and kidney.

Surgical treatment of pyonephrosis may become necessary in pregnancy, but as it is likely to be followed by a chronic discharge in the lumbar region, there is great risk of puerperal infection when labor occurs. The operation should always be postponed if possible, until the uterus has been emptied and the puerperium somewhat advanced.

Termination of pregnancy for the purpose of curing a pyelitis is not to be considered except possibly in the rare instance of an acute development in the early months. Within recent years, radical local measures have been applied to the treatment of pyelitis, viz., catheterization of the ureters and irrigation of the renal pelvis. In acute cases these procedures are not to be employed as a rule, because of the trauma likely to be produced in the swollen ureteric mucosa. I have known bleeding to be caused, resulting in the formation of a fibrinous clot, which caused intense suffering. Moreover, irrigation or application of antiseptics is only of short duration and can be of little influence in destroying the microörganisms. The use of such methods has been widely abandoned in puerperal sepsis. Why use it in a tract far more delicate than the uterus and much more difficult of access?

The only possible benefit to be obtained from ureteral catheterization is the evacuation of urine accumulated above some narrowed part of the ureter. I would, therefore, employ this procedure if marked colicky pain suggested obstruction. In one case, I relieved a patient greatly—the passage of the catheter being followed by the escape of a spindle-shaped fibrinous clot which was impacted in the ureter close to the bladder.

In chronic pyelitis irrigation of the ureters and application of antiseptics, *e. g.*, silver salts, has been very little employed in pregnancy. The results of this form of treatment have been disappointing as regards effecting a permanent cure and I am not in favor of using the method in pregnant women.

COURSE AND PROGNOSIS OF PYELO-CYSTITIS IN INFANCY.*

By Clifford G. Grulee, M. D., Chicago, Ill.

It is peculiar that to the majority of general practitioners pyelo-cystitis in infancy is almost an unknown condition. This is repeatedly brought to the mind of the pediatrician, and time after time a child who has been sick several weeks, even months, with a high, irregular temperature and no other involvements to be noted, shows upon examination of the urine large quantities of pus. If the condition were a rare one we could explain this lack of knowledge, but of the acute febrile affections of infants it must rank among the first five or six in point of frequency; and it is therefore of great importance that due attention be paid to it.

Probably the chief reason that this condition is not recognized more frequently is that the symptoms, as a rule, do not point to the urinary tract. The onset is usually sudden with high rise of temperature and little else. Urination is not noticed to be more frequent nor is the urine irritative. In fact the chief characteristic aside from high fever is almost entire absence of physical findings. This is so marked that it alone should lead one to think immediately of urinary infection.

Following the onset with sudden rise of temperature, the fever continues usually quite irregularly. Various types may be mentioned. We have in some instances the high continuous type of temperature ranging from 104° to 106°, never dropping. This may lead in a few days to death. An example is the following:

A girl baby, age 10 months, was seen by me on the afternoon of the 23rd of November. Six days previously the mother had noticed that the child was not well; fever was noticed but no other symptoms. The following day the child became much worse, a physician was called who diagnosed gastro-intestinal disturbance; the following day the child showed no symptoms except the temperature which ranged from 104° to 106°; she was very apathetic; the stools, two to three a day, contained some mucus and curds, probably due to cathartics. With this exception the history was negative. On very careful examination of the child no physical findings were to be met except those which go with a severely toxic infant with a temperature of 104° to 106.° On the evening of the 23rd of November she entered the Presbyterian Hospital where she died early the morning of the 25th. During her stay in the hospital the temperature ranged between 103.2° and 106°; during the last 24 hours it never dropped below 104°. The blood count showed 3,800,000 reds, 70 per cent. hemoglobin, and 21,700 whites. On examination of the urine there was found albumen and a number of pus cells, 10,200 on the first count, and 17,000 on the next day.

Much more characteristic is the febrile curve, where it is one which shows a marked tendency to rapid rises and

*Read at the Joint Meeting of the Chicago Gynecological and Chicago Urological Societies, March 17, 1916.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, May, 1916.]

falls. This is shown quite well in these temperature charts. You will see that it is not uncommon for the temperature to rise from normal to 103° or 104° within a very few hours; again, a drop may be of the same character. This is of such common occurrence that a history of rapid rises and falls in temperature over a long time with lack of physical findings speaks very strongly for a diagnosis of pyelocystitis.

In observing cases in the hospital it is often seen that the temperature will remain almost within the normal limit for several days, and sometimes several weeks, then without any reason which can be noted the temperature will show a sudden rise then fall again to its former limit. Almost always at the times when the temperature rises there is found to be an increase in the cell count of the urine. The course of the temperature curve is usually a fair index of the prognosis of the case in acute stages. As the temperature declines, the quantity of pus in the urine, as a rule, becomes less.

Of the physical findings which accompany this disease and which are so few, those of the skin are perhaps the most important. At the time of the onset, or soon thereafter, and usually during the acute stages, there is a distinct pallor in all probability due to vasomotor constriction of the peripheral vessels. There is a marked tendency to a dry, sometimes scaling, skin and it is not infrequent to see transient erythematous reddening more or less generalized. Again, not uncommonly in the course of this condition there is found to be a slight but distinct reddening of the pharynx which may lead to a slight dry cough. As a rule the gastro-intestinal symptoms are of slight degree, though the condition, of course, may lead to a state of marasmus of a character very resistant to treatment. Usually during the acute febrile stage there seems to be an increased number of stools which are frequently green in color and may contain curds and mucus. Vomiting at times is a symptom but cannot be regarded as characteristic. Sometimes when the condition is a severe one it is possible to palpate the lower poles of the kidneys; this, of course is more frequently found true on the right side.

Of prime importance in this condition is the examination of the urine. In the very early stages in all the cases which I have seen, pus is not present but a distinct bacilluria exists. Within 24 to 72 hours the pus makes its appearance and is usually present in large amounts. In determining the presence of pus in these cases it is never necessary or even wise to resort to the centrifuge. A few drops of urine placed on a slide under the microscope are sufficient to confirm the suspicion as to the presence of infection in the urinary tract. In order to follow the course of the disease more or less roughly and to determine the prognosis, it is of value to count the number of pus cells. This may be done with the usual Thoma-Zeiss hemacytometer slide in much the same way as the white

cells of the blood are counted. The white blood corpuscle pipette is filled up to "1" with the diluting fluid (2 per cent. acetic acid); the pipette is then filled up to 11 with urine. The entire field is counted, 9 large squares, the number multiplied by 11/9 which gives the total number of pus cells per cubic millimeter. I have found this method of much value in determining the progress of the treatment and feel, that in a general way, it may be depended upon. There are several theoretical objections to this procedure, but from a practical standpoint it is, I think, of value. Albumen is found during the acute stages, due probably to the pus or to the bacilli. In the more chronic stages, after the condition has lasted for some weeks, it is not infrequent to find red blood cells in small numbers and some casts in the urine.

On examining bacteriologically, the causative organism, in far the greatest number of cases, is found to be the colon bacillus; occasionally streptococci and more often staphylococci are found. It is of a great deal of value in the treatment to determine the nature of the organism. In case this is not done it is fair to assume that it is due to the colon bacillus until it is proven otherwise.

I recently had a case in a new-born infant caused by the bacillus pyocyaneus.

Prognosis.—Pyelocystitis is usually looked upon as a condition which, though running a high temperature, gives an almost absolutely good prognosis. My experience with these cases has been quite to the contrary. While it is true that a large proportion do recover without serious consequences, it is also true that a very great number have repeated attacks of the infection and that not a small proportion of these infants succumb to the disease, either in the acute stages or later. It is not to be regarded, in my opinion, as a condition which is to be looked upon lightly by the profession, and I would strongly urge that more attention be paid to the early diagnosis, since, as a rule, the results to be obtained bear direct relation to the time after the onset when the diagnosis is made. Death in these cases may occur during a very acute onset, such as the case previously mentioned, or the condition may become sub-chronic, existing for several weeks, the infection spreading and the child gradually succumbing to a sepsis. Or the condition may so deplete the infant's organism that a marasmus of parenteral cause is produced and the child succumbs to some intercurrent infection. Much more likely than a fatal termination is the tendency to repeated attacks, and no man who has seen many of these cases but is impressed with the fact that no matter how thorough the treatment may be according to the lines laid down at present, repeated attacks are very common.

The attacks, as a rule, tend to become less severe but one can never feel satisfied that a case of pyelo-cystitis is effectively cured and that there is

not present at least a tendency, probably a focus of infection, which will result in a second, a third, or more attacks. How long this can last I do not know. We have a definite record of one case which entered the Presbyterian Hospital four years ago, has been back repeatedly since, and at last accounts showed many pus cells in the urine and the condition was such that we were unable to produce any effect from our treatment.

It would seem to me not at all unlikely that some cases of pyelo-cystitis of pregnancy might be due to this condition, and that the infection existed with repetitions, the nature of which had not been recognized during the intervening years.

The danger of a chronic nephritis resulting from pyelo-cystitis in infancy is relatively slight. Of 73 cases of chronic nephritis in infancy and childhood which Heubner was able to collect from his records (of 17,000 cases), only six were due to pyelo-cystitis, in his opinion.

In closing I wish to lay emphasis on the fact that pyelo-cystitis is a common condition in infancy, that frequently its only symptom is fever, the cause of which is determined only when the urine is examined; that the condition is one whose seriousness has been greatly underestimated, one which not infrequently leads to death, and which has a marked tendency to repetition in a large proportion of cases.

SOME FACTORS IN THE DIAGNOSIS OF KIDNEY AND BLADDER INFECTIONS.*

By Arthur H. Curtis, M. D., Chicago, Ill.

Among the many problems worthy of consideration in the diagnosis of kidney infections, it is my purpose to discuss only certain topics of special interest. Cystoscopic technic, pyelography and some other subjects will not be considered.

Two qualifications are essential in one who ranks as a competent diagnostician of inflammatory affection of the kidney. Firstly, a mastery of cystoscopic technic is vital. Secondly, a thorough knowledge of bacteriology and associated laboratory procedures is needed to complement the cystoscopic work. The former need is now given widespread recognition. The latter is not so generally recognized; yet it is true that a cystoscopist who shuns bacteriology lacks important requisites for thoroughly efficient service. If the cystoscopist does not perform laboratory work, he should not only carefully collect urine in every case, but should also supply the bacteriologist with a fitting summary of the clinical data, and thereafter observe, in person, the results obtained.

The History and Preliminary Examination.—As my experience increases it is found advisable to put forth unusual effort in tracing the origin of infection. We all have a tendency to look too quickly inside the bladder, before sizing up the situation from the outside. Five extra minutes devoted to questioning often reveals the nature of an otherwise baffling case. The history is sometimes the only means of detecting a neurosis which has masqueraded as a kidney infection; the onset of a mysterious infection may result from peculiar habits of life—such, for instance, as micturition only once or twice daily, the habit of only partially emptying the bladder, self-passage of catheters, and other abnormalities.

Regular examination of Bartholin's glands, palpation of Skene's ducts, and search for protruding urethral granulations, demonstrate gonorrheal infection in many supposed neurotic patients with negative urinary and cystoscopic findings.

Residual urine is a frequent source of trouble. Examination to exclude this condition is notably necessary in cystocele cases.

The Cause of "Catheter" Cystitis.—And here I wish to strongly emphasize one belief. Post-operative and post-partum cystitides have long been called catheter cystitis. To my mind it is er-

*From the laboratory department and gynecological service of St. Luke's Hospital. Read at the Joint Meeting of the Chicago Gynecological and Chicago Urological Societies, March 17, 1916.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, May, 1916.]

roneous to place the chief blame on the catheter. Patients who develop catheter cystitis suffer from urinary retention, and I am most deeply impressed that retention is the factor of prime importance.

Those who are sceptical I ask to study the question with this in mind. They will find that catheter cystitis in patients capable of thorough evacuation is of rare occurrence, except in a mild and transitory form.

Cystoscopists are notoriously careless in their technic. Yet I venture there is not one here who can recall having produced a cystitis of any moment, in any case he has ever examined. Passage of a catheter with ordinary cleanliness and care plays at the most a minor part, and is not the essential cause of the cystitis; these post-partum and post-operative patients are more freuently the victims of *urinary stasis cystitis* from varying degrees of urinary retention.

Culture Making.—In every case of infection above the level of the vesical sphincter the sedimented urine, secured by catheter, should be stained for bacteria. The findings so obtained do much to confirm or discredit the results obtained by culture.

This is not a timely opportunity for discussion of culture media and technic. But, in passing, we should recall that numerous bacteria flourish only in media containing blood, ascitic fluid, or animal tissue; and we all know that anaerobic cultures are needed as a routine.

Employment of a tube of broth as a single agar slant does not suffice. Organisms so implanted produce a growth which gives us a distorted impression of the extent of infection. In fact, stray contaminating bacteria can overgrow and hide the real cause of trouble.

Neither is implicit faith to be placed in plate cultures, for many bacteria grow poorly or not at all by this method.

It is high time for us to attach more significance to the number of colonies which develop in the culture media; for it is necessary to determine not only the character, but also the extent and the purity of growth, in order to form a rational opinion of the disease process. This means that isolation of colonies is to be sought for. Knowledge of the amount of infection, obtained in this way, is of much diagnostic and prognostic value.

Interpretation of Cultures.—Staphylococci and certain other bacteria are bound to cause frequent contamination. One gradually learns to recognize most of these invaders and to correspondingly discount their significance.

A diagnosis of staphylococcic pyelitis can be made with certainty, but this must be done with utmost caution. The occurrence of a pure culture alone is extremely untrustworthy evidence. It should be substantiated by the presence of considerable numbers of staphylococci, without other bacteria, in the sediment of fresh catheterized specimens.

The discovery of intracellular cocci is an added evidence of much significance.

Sometimes a contrary result, such as a good growth of streptococci, may appear when least expected. Findings of this nature disproportionate to symptoms, can not be accepted without investigation.

Limited dependence should be placed on meagre scattered growth, especially when this contains colonies of different kinds. Yet I believe the future will show mixed infection of the kidney to be more common than now credited. Anaerobes, especially, are often present in mixed cultures. An illustration is afforded by a kidney, uncontaminated by instrumentation, aspirated pus from which revealed large numbers of five different kinds of organisms.

Failure of growth does not exclude infection. In the presence of visible inflammation, negative cultures are inconclusive. Just as pus may not appear constantly in the urine, so I have several times been able to obtain growth only at irregular times. And although present-day technic is greatly improved, some bacteria still refuse to be transplanted to artificial media.

Diagnosis from Vaccines.—My subject does not include vaccine therapy, but from the standpoint of diagnosis we may encroach on this field. Many absolutely decry the use of vaccines. Despite this, I am looking for those who have personally made vaccines for a considerable number of patients and have given them a fair trial without some success.

Vaccines must be made with detailed care. The first dose should be very small and subsequent ones gradually increased until improvement is noted. Most important of all, that dose which produces favorable results should be persisted in as long as improvement continues.

Success from vaccines is confirmatory of the bacteriologic diagnosis. Failure suggests an incorrect bacteriologic diagnosis or a complicating condition, such as stone, tuberculosis, or obstructed drainage of pus or urine; this is notably true of infections with strains of the B. coli group.

Animal Injection.—The injection of animals is an advisable procedure in any undiagnosed case with serious infection.

We should not limit animal injection to suspected cases of tuberculosis. The virulence of infections of other kinds, with some indication as to the probable course, is often well shown by injection of rabbits. To illustrate: A recent patient with double pyelitis had symptoms of moderate severity, with large numbers of B. coli colonies in pure growth in cultures. There was no reason to anticipate an unusually severe course. Animals injected with the fresh cultures, however, died almost at once, and investigation showed that 1/100 of the usual lethal dose was sufficient to produce death. These results enabled us to predict, and to prepare for,

an unusually severe course. Otherwise we would have been at a loss to account for the subsequent serious illness which ensued.

Many other less striking, but similar, instances impress me that animal work does much to put us in closer touch with conditions which we ought better to understand and which are intimately concerned with the welfare of our patients.

Also, we remember recent claims of remarkable affinity of bacteria for special tissues, an affinity so characteristic that lesions which occur in experimental animals tend to reproduce, in miniature, those existent in analogous tissues of the patient. Thus far in my experience, however, after numerous and repeated attempts to obtain such results, it has been possible to discover little more evidence of special tissue affinity than has been known for a considerable period of time.

Summary.—Urinary tract infections are not accorded the thorough differential bacteriological study which accurate diagnosis requires. Cultures should be made in selected media in such manner that isolated colonies develop; this permits reliable deductions as to the extent and purity of growth.

Post-operative and post-partum infections of the bladder are largely the result of urinary stasis; contaminated residual urine is far more responsible than is the passage of catheters.

Extensive use of experimental animals guards against mistakes in diagnosis, furnishes an index to the virulence of infections, and otherwise gives us a better knowledge of the diseases with which we have to deal.

TREATMENT OF PYELITIS.*

By Herman Louis Kretschmer, M. D., Chicago, Ill.

It is not my object to discuss the various forms of therapy that have been recommended in cases of pyelitis, but to present the treatment used, and the results obtained, in this series of cases.

This paper is based on a report of 38 cases. Of this number 16 cases occurred in females and 19 cases occurred in males, and in 3 the sex was not stated. Thirteen cases were bilateral, twelve occurred on the left side, and thirteen occurred on the right. Two cases occurred during pregnancy and one occurred during the puerperium. Most of the bacteriological work was carried out by Dr. Gaarde, with whom a detailed report will be published later. The colon bacillus was found in all but three cases—in two staphylococcus was found and in one a streptococcus. Pyelitis due to the streptococcus occurred in one case during pregnancy.

Nearly all of the cases belonged to the group usually designated as chronic pyelitis. The question of whether pyelitis can exist without involvement of the renal parenchyma is one that always results in a good deal of discussion. Undoubtedly the pyelitis in a large percentage of cases, is secondary to infection of the renal parenchyma; this in many cases, doubtless, clears up, so that the pelvis and ureter remain the seat of infection. Cases in which this has occurred come to us usually without evidence of previous kidney involvement, and are grouped as cases of pyelitis.

In selecting cases for treatment by pelvic lavage, it is well to bear in mind that most of the cases of pyelitis are associated with organic disease of the kidney, pelvis or ureter, such as stone, stricture, dilatation, tuberculosis, etc. This group of cases requires appropriate surgical treatment and is not to be considered in this paper. Unless a careful selection of cases is made, the treatment must result in failure; for example, we can hardly hope to cure pyelitis due to a stone, T. B., etc., with this form of treatment. It is evident, therefore, that cases to be subjected to pelvic lavage must be thoroughly studied before instituting this form of treatment. Roentgen ray examination, pyelography, and guinea-pig inoculations when necessary, must be resorted to in all doubtful cases. From our results we believe that we are justified in stating that this form of treatment has given us very prompt results. Whenever prompt results are not obtained, it is reasonable to assume that the case under treatment may not be one of simple

*Read at the Joint Meeting of the Chicago Gynecological and Chicago Urological Societies, March 17, 1916.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, May, 1916.]

pyelitis, but may have one of the previously mentioned etiological factors.

When speaking of a cure it is well to state just what is meant. We have not discharged as cured any patient who did not fulfill two requirements; first, the urine must be free from pus, and second, cultures of the urine obtained by ureteral catheter must be sterile. To free the urine of pus was a relatively easier task to accomplish than it was to obtain sterile cultures. We have repeatedly seen the urine free from pus and a disappearance of the clinical symptoms following one or two treatments, but the cultures still showed the presence of the causative organism. It is evident that too much stress cannot be laid upon this fact, and it is easy to understand why many of the cases relapse if the treatment is stopped before the cultures are sterile.

In order to prevent recurrences, as much as possible, it is essential to relieve any focus which may be the cause of a relapse. In the cases occurring in women for example, we had no difficulty in obtaining sterile kidney specimens long before the bladder urine became sterile. It would seem, therefore, to be necessary to continue treating the bladder until it is free of the offending microőrganism. Bauereisen and others, have shown the direct lymphatic connection between the kidney and the bladder *via* the lymphatics of the ureter, and it seems reasonable to assume that failure to cure the bladder infection accounts for a part of the recurrence.

In males we are impressed with the great frequency with which we found signs of an associated prostatitis and seminal vesiculitis. In one of the cases in which the patient had only one kidney, there were three distinct relapses, due we believe, to failure on his part to carry out treatment for his prostatitis.

From our experience in this series of cases, we believe that pelvic lavage gives a greater number of bacteriological cures in a shorter space of time, than any other form of treatment. In several instances we obtained sterile urine after one or two treatments in patients who had been upon internal treatment for several months.

It is not my object to discuss the various drugs that have been employed in the local treatment of pyelitis, nor to discuss the many drugs recommended for internal use, but to state briefly the technique as it has been employed by us in treating this series of cases. We have had no occasion to resort to the use of continuous drainage by means of a permanent catheter placed in the ureter. As a routine a one per cent. solution of silver nitrate was used. In only one case did we use silver in a stronger solution (2 per cent.). It did not seem to make any difference in the rapidity with which a cure was obtained. We cannot see any advantage in using a stronger solution, for example 5 per cent., as recommended by Geraghty. The amount of

solution injected varied from 5 to 10 c.c. As an average we employed between 5 and 7 c.c. It is of the utmost importance when carrying out this treatment, that great care be taken to avoid a rapid filling of the pelvis, and not to use too large amounts. If the injections are carried out slowly and one avoids distention of the pelvis, there is practically no pain, except that incident to instrumentation. In one of the cases the pelvis was irrigated with 30 c.c. of boric solution before injecting the silver nitrate solution. This was carried out in a case in which there were large amounts of thick pus flowing out of the catheter. Small ureteral catheters were used, so as to allow the fluid to flow from the pelvis down the ureter. In some of the cases, catheters were passed into the pelvis, and in others only about half way. The treatments were carried out about once every five or six days.

In one of the cases of pyelitis of pregnancy, there was associated dilatation of the kidney pelvis, so that a residuum of 20 c.c. of urine was present. This was first drained away, the pelvis was then irrigated with a solution of boric acid until the washings returned clear, after which the pelvis was injected with 15 c.c. of a 10 per cent protargol solution.

Autogenous vaccines were used in about one-half of the cases. The internal treatment was carried out with three drugs, which were administered as follows: During the first week, after the diagnosis was made, the patients were given about one teaspoonful of bicarbonate of soda, three times a day, so as to thoroughly alkalize the urine. During the second week the soda was stopped, and in its place acid sodium phosphate was administered, so as to thoroughly acidify the urine. During the second week, that is, during the week of acid urine, urotropin was given, varying in amounts from 30 to 70 grains per day. In the cases in which the urotropin produced vesical symptoms, the amount was naturally reduced. This form of internal treatment was kept up during the alternate weeks, as long as the patient was under treatment. The urotropin and soda bicarbonate were not given simultaneously.

Our experience with other drugs has been too limited to permit of any definite statements relative to their merits.

Pyelitis following pregnancy can be treated along the lines suggested, and in fact is no different, nor need to be managed any differently than any other case of pyelitis. When the pyelitis occurs during pregnancy several points come up for consideration. Cases of pyelitis of pregnancy in which internal treatment failed were formerly handled by emptying the uterus. This form of treatment for pyelitis during pregnancy is based upon the well-known fact that after pregnancy the symptoms of pyelitis disappear. Whether or not the pyelitis really is cured is another point for discussion. As a matter

of fact, many of these cases are still treated in this way. With the institution of pelvic lavage in the treatment of pyelitis, and its application in the treatment of the pyelitis of pregnancy, one is justified in stating that the pregnant woman should be given the benefit of this form of treatment before the pregnancy is interrupted. Surgical attack of the kidney for pyelitis of pregnancy should only be considered after a failure of pelvic lavage.

Of this series of cases we were in a position to institute pelvic lavage in sixteen and to carry out the treatment to completion in fourteen. Two cases left before they were discharged. The cases in which only a diagnosis was made, and those in which only one treatment was given, are not considered in this report irrespective of the fact that the clinical symptoms disappeared and the urine cleared up.

The report embraces only those cases which were discharged as cured.

Two of the 16 patients had but one kidney, the other having been removed by nephrectomy. Both were discharged with urine free from pus and sterile. In one of these two cases a male patient came back to us with two relapses. He suffered also from a chronic prostatitis and seminal vesiculitis, and would not co-operate with us in carrying out his end of the treatment for these conditions.

As regards sex, there were five females and ten males, and in one the sex is not stated.

Number of Injections Required.—In five cases sterile cultures were obtained in two injections. Four cases required three injections. One case four injections. In one case six injections were required, later a relapse, which required two injections.

Failures.—In these sixteen cases there were two in which a cure as previously defined was not obtained. One of these occurred in a case of staphylococcal pyelitis. At the present time his urine is sterile, but it is not free from pus. The other was a case of pyelitis of pregnancy in which the urine is free from pus but not sterile.

Joint Meeting of the Chicago Gynecological and Chicago Urological Societies.

Held March 17th, 1916, with the President of the Chicago Urological Society, Dr. H. L. Kretschmer, in the chair.

Dr. J. Clarence Webster read a paper entitled "Pyelitis During Pregnancy." (May issue, this journal.)

Discussion.

Dr. N. Sproat Heaney: One point emphasized by Dr. Webster has always been very well fixed in my mind. I remember, as an interne, the number of cases that came to Dr. Webster to be operated upon for appendicitis in pregnancy that proved to be pyelitis. Since being in this special work, I have had a number of cases of pyelitis in pregnancy referred to me under the diagnosis of appendicitis, and during this same time I have never seen an acute appendicitis in pregnancy. Pyelitis in pregnancy is a subject which, I think, should be pounded into the general practitioner. The diagnosis of pyelitis in pregnancy should be emphasized as greatly by the gynecologists and obstetricians as is appendicitis by the general surgeon. There is, of course, a similarity between the symptoms of both affections.

I hesitate to venture on the subject of treatment in this gathering, as to whether or not catheterization of the ureters is necessary in pregnancy. I have seen patients treated both ways, and have not seen a case that I thought was especially benefited by the catheterization of the ureters.

One thing that I think is of particular importance in the treatment of pyelitis in pregnancy is posture—not only having the patient lie on one or the other side to relieve the ureter of the affected side from pressure, but by having the patient get in the knee-chest position frequently, having the air enter the vagina, so that the uterus may ascend into the abdomen, thus, for a while at least, allowing the ureters to drain. In several instances I have seen an immediate disappearance of temperature. I have never seen a case of pyelitis in pregnancy, treated by any method, in which the urine entirely cleared of all pus cells and microörganisms while the pregnancy was still existent. The most to be hoped for is a disappearance of the fever and pain, and lessening of the amount of pus. The "laboratory" cure of the patient must be made after the pregnancy has ended.

* * *

Dr. Clifford G. Grulee, read a paper entitled "Course and Prognosis of Pyelocystitis in Infants." (May issue, this journal.)

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, May, 1916.]

Discussion.

Dr. Joseph Brennemann: In estimating the course and prognosis of pyelitis, one has to think, first, of the pathology of the condition, and try to settle this. One might get the impression from the paper, although I do not think Dr. Grulee would want to give it, that pyelocystitis is a definite entity, which always runs a certain course, very variable at times, but nevertheless always the same thing. Now, that really is not true. There are probably a number of different things of which we all speak as pyelocystitis, which have only one thing in common, namely, pus in the urine. The only way one could tell much about these cases would be from autopsy, of course. The vast majority do not die, therefore we have very few autopsies. Moreover, in those cases in which it has been possible to hold autopsies, the findings have given us a wholly misleading idea, because it is only a very severe type that dies.

I have seen probably thirty or forty cases of so-called pyelocystitis in babies, and in that number there has been only one death. Finkelstein, in his series of something like eighty cases, speaks of twenty autopsies—that is, one-fourth died. The difference between the two is simply a difference in pathology. The cases in private practice occur under favorable circumstances; those in foundling hospitals are entirely different, and that brings us to the consideration of the pathology. A number of these cases, in all probability, are simply cystitis. That was Escherich's idea. He was the first to speak of these cases. He thought the condition was a cystitis due to a colon bacillus infection. Then, later, through Heubner and others, it was made rather probable that those cases were not simply cystitis, but an ascending infection, in which there was a cystitis and a pyelitis. More recently authors have spoken of the condition as pyelocystitis, with emphasis on the pyelitis rather than on the cystitis. Probably those cases in which there are rigors, chills—which practically never occur in babies except in pyelitis, and which are of great diagnostic value—high temperatures and pallor, are pyelocystitis, with the emphasis on the pyelo. In the thirty or forty cases which I have seen, all but two or three have occurred in female children and this fact has led me to believe that these cases are due to ascending infections, occurring during the diaper age. If one sees a female baby that has just had a copious liquid bowel movement, that floods that whole region, it is easy to see why a certain amount of feces containing colon bacilli might get into the bladder and produce an ascending infection. Although there is a tendency toward the hematogenous theory of infection, I still believe that the great majority of these cases are due to ascending infection. In the vast majority of these cases the colon bacillus is the predominating organism.

Then there is a third group of cases—the type found in foundling homes, in which there is not simply a pyelitis and cystitis, but a pyelonephritis or a pyonephrosis. In these cases there are multiple, small, cortical hemorrhages. Fifty per cent. of the autopsies held upon these cases have shown them to be of that type, and nearly all of them have been in the foundling homes. Those babies are in poor environment, and therefore in poor condition, and the infection is a graver one. It is a peculiar fact that nearly half of such cases have been in male children, and one, therefore, can see why it would be easy to believe that those cases were wholly of hematogenous origin and had very little to do with the other types.

Then I think there is still another class of cases, seen especially during epidemics, such as the one occurring here last winter of "grippe." In many of these cases, if we examine the urine, we will find a large number containing pus. These cases clear up quickly. They are probably not colon bacillus infections.

This is one of the fields in medicine that require investigation. I have an idea that we will find some day that the ordinary typical case, such as Dr. Grulee has described, is a pyelocystitis due to the colon bacillus. I believe we will find that these cases which occur in girls, under good environment—healthy children, always practically under one or two years—are due to ascending infection, due to the colon bacillus, and that these other cases are either an infection accompanying a generalized infection, or that they are in many instances a toxic pyelitis, possibly without any organisms at all.

When one comments further on the prognosis and course of these cases, one has to speak for a moment of the treatment. Unfortunately, we do not differentiate these cases enough. We treat them all as one thing, and give the same medication. As Dr. Grulee emphasized, that ought not to be done. We do not like to catheterize these cases, and a female child is not well adapted to give a specimen not containing many microörganisms, consequently it is often very difficult to tell whether there are organisms present, or just what organism is present. It is difficult, therefore, to tell whether the case belongs to a certain category or not. The colon bacillus infections are usually very easy to tell from the fact that they occur in girls, from the presence of the colon bacilli, and from other things that happen in connection with them. Until we know more definitely, we are very apt to have a certain routine treatment, and there we differ very widely in our ideas. Some of us are very enthusiastic about urotropin. I personally am very strongly in favor of the treatment, recommended by Thompson and still, namely, the use of potassium citrate in doses of one to two drams a day. My usual treatment is this: I give potassium citrate

for a while, and then, if the patients are in a chronic stage, or latent stage, I give urotropin, possibly salol, and then, if there is an excerbation, I give potassium citrate again because I think it has a specially favorable action at such times.

As to the number of cells telling us anything about the prognosis and severity of the disease, I have had no special experience with that, except that which comes from examining a lot of urines in these cases. I have never had the impression that one could tell much from the number of cells. I have seen cases in which there was not a great deal of pus, that were hard to cure, and others in which there was a good deal, and yet they responded promptly, and *vice versa*. I have not made accurate observations numerically, so cannot speak very intelligently about it.

Finally, it is well to emphasize that these cases are very common. They are almost invariably overlooked, as Dr. Grulee has said. We see them over and over again, and always they have been diagnosed as meningitis, or pneumonia, or most commonly the good old-fashioned "intestinal disturbance," although there is nothing the matter with the bowels, or stomach, or lungs, or brain, or anything else except the urinary tract.

* * *

"Some Factors in the Diagnosis of Kidney Infections," by Dr. Arthur H. Curtis. (May issue, this journal.)

"Treatment of Pyelitis," by Dr. Herman L. Kretschmer. (May issue, this journal.)

Discussion.

Dr. G. Kolischer: It is impossible to discuss this subject without taking into consideration some of the special features of the causative pathology. It is pretty generally accepted among competent observers that interference with the urinary flow is one of the primary causes of pyelitis. Taking up, for instance, the pyelitis in pregnant women, I started to investigate this matter systematically some twenty years ago, and examined two hundred women in this respect. We found in about fifty per cent. pregnant beyond the sixteenth week, that there was on one side at least a slowing-up of the urinary flow, and the intervals between the urinary jets were extended beyond the normal length of time. In about one-quarter of these cases in which the slowing-up of the urinary flow was to be noticed, we found by catheterizing or sounding the ureter of this side that there was an obstruction.

I want to call attention to one very important point, namely, invariably in all of these cases with obstruction this was not found in the pelvic but in the abdominal section of the ureter. How did this obstruction occur? Of course, it is known, as Dr. Webster stated, that the uterus during the later weeks of pregnancy will lean to one side or the

other. Now, then, if an obstruction occurs and the uterus leans to this same side, we can assume that the uterus *in toto* obstructs the ureter, but if the uterus is bent toward the other side, and there is an obsruction on the opposite side, then one is entitled to assume that not the uterus *in toto* obstructs the ureter, but that a fetal part presses against it.

I would like to mention at the same time that if you meet an obstruction and find such a slowing-up of the urinary flow, with extension of the intervals between ejaculation of urine, and you pass the catheter beyond this point of obstruction, the intervals between ejaculation are not shortened, and consequently one is entitled to assume that the slowing up of the urinary flow is not only due to this obstruction, but also to an edema of the ureteral mucosa, and an edema of the pelvis of the kidney, leading to reduction of the contractability of this renal pelvis.

Suppose we are entitled to believe that the fetal part obstructs the ureter, then we can resort to a very simple expedient, namely, placing the patient on the side on which the obstruction occurs. We know if a fetal part rests for any length of time against the wall of the uterus, that that part of the uterine wall will contract and remove the fetal part from that part of the uterus. In several of these cases the patients have been given relief by this method of treatment.

As to the causative pathology so far as the frequency of pelvic infection on the right side is concerned, Frankenthal was the first one to call attention to the connection, especially in pregnant women, between appendicitis and renal infection of that side. It was later on taken up by the French, and they called it the "*Nephrite appendicu laire*," meaning that this one-sided nephritis is based on acute appendiceal infection. We know that the lymphatics of the right side, between the cecum and ureter, are very intimately connected. It is, furthermore, easily explained that such infections occur frequently on the right side, because the serosa free part of the cecum is in close contact with the ureteral sheath. So we are entitled, now, to believe that most of the infections of the pelvis of the kidney originate in the large intestine and lymphatics. If we have to deal with streptococcic infection of the kidney, a hematogenous invasion, we find the primary foci in the glomeruli, furnishing a very characteristic picture.

If the condition cannot be relieved by eliminating the uterine pressure, then there is only one thing to do, namely, insert a ureteral catheter in order to drain the pelvis of the kidney. It is assumed by many authorities that there is no pyelitis without distention of the pelvis and that the normal pelvis has no lumen whatever. If there is a lumen, then there is pathology, so we drain the pelvis, and by leaving the catheter in for some time we also will ac-

complish the disappearance of the edema of the ureter.

As to lavage of the pelvis, it is my belief that it is not so much what we inject into the pelvis, but rather the fact of draining the pelvis—may be, flushing it out, the mechanical part of the treatment —that is effective. That may explain the different reports and enthusiasm of different authors regarding the different solutions used. That it is the mechanical effect has been proven by another clinical experience, namely, if we try to release an impacted ureteral stone by injecting oil, we quite often relieve the patient of all the clinical and subjective symptoms, although the stone is not removed, simply because we washed away the débris and established free drainage.

As to vaccine therapy, while the original enthusiasm has died out, yet to a certain degree, it cannot be denied that the combination of drainage and vaccines occasionally furnishes excellent results, but it is very important to use the autogenous vaccines—autogenous not only in the sense that the vaccine is cultivated from the urine of the patient, but that the cultures are taken from the place of infection. If one will examine carefully, and this is especially easy to do in women, one will find that the flora in the urethra, the bladder, if infected, the ureter and pelvis of the kidney are of different characters; for instance, streptococci in the urethra, staphylococci in the bladder, and almost invariably colon bacilli of different strains in the ureter and kidney. If you take urine out of the bladder with the catheter, in most of the cases you will get a mixture of germs, consequently your vaccine is not the vaccine that you want to use. Therefore, if you want to make vaccines at all, you have to take them out of the ureter or pelvis, avoiding contamination as much as possible.

As to the most heroic treatment of pyelitis and pyonephrosis in pregnant women, that is, the premature emptying of the uterus, that depends entirely on two conditions, namely, the condition of the vascular system and the condition of the heart muscle. If there is a simple valvular disturbance, especially if compensated, combined with a pyonephrosis or pyelitis, it is unnecessary to empty the uterus. But if we have to deal with high blood-pressure, endocarditis, and pyonephrosis, then the indication for emptying the uterus has to be considered because we know that with the progress of the pregnancy and with the eventual delivery, we have an added strain on the heart, which the myocarditis heart may not be able to stand.

As to pyelitis in children, I cannot see how anybody can diagnosis a cystopyelitis or pyelocystitis on a living child without examining the bladder.

As to the number of pus cells, we must consider this. Quite often exacerbation is coincident with a reduction of the number of pus cells, because the ureter happened to be blocked.

Pyelitis in children is a very important affair and I am fully in accord with the two pediatricians as to its dignity. Permit me to report another experience:

Several years ago I presented a paper before the Gynecological Society on pyonephrosis in women, and reported that in the majority of cases where I was compelled to remove a kidney for pyonephrosis I was able to trace the original infection back to early childhood. I would like to mention at the same time that so far as I know the first man who made the positive statement that we cannot consider our task finished in treating a pyelitis when the pus has disappeared from the urine, but that the urine must be sterile, was Dr. I. S. Koll.

DR. CHARLES S. BACON: I have seen a number of cases of pyelitis, but I have never seen a case where I found it necessary to either empty the uterus or wash out the pelvis of the kidney or to make an opening into the ureters or pelvis. But I always have in mind the idea that I have not seen any really very severe cases, and I am liable to meet one at any time.

We hear every little while the proposition that the ureter shall be opened and drained from the outside. Some two or three years ago E. P. Davis, of Philadelphia, defended that proposition.

Then the question of emptying the uterus nearly always comes up in any cases of any severity at all. From my own experience, I doubt the necessity.

It seems to me that if we will put the patients at rest and treat them in a conservative way, possibly with vaccines—which I have some doubt about, although I have seen some results from their use in non-pregnant cases, but have hesitated to use them in pregnant cases—using methods of cleaning out the intestines, which seems to me to be important, and regulating the diet, that is sufficient.

There seems to be a certain wisdom in catheterization and washing out the kidney, and still there is question as to the permanency of the result. We don't consider that washing out cavities, as a rule, accomplishes a great deal, and so this has to be settled by experience.

One word about the causation: That a good many cases of pyelitis in pregnancy are returns of former infections is pretty well established. We know the great persistence of these infections, and it is extremely probable that an ascending infection may date back to childhood. Possibly somewhere between twenty-five and thirty per cent. of the cases are of that nature. Many believe that the infection from the intestine passes in some way by continuity directly through the serous coat; this, of course, is not true. As Dr. Kolischer has just described, the infection passes from the uncovered portion of the intestine through the lymphatics of the ureter to the kidney. The larger part of these infections are explained in this manner.

The hematogenous infections I feel rather shy about. Without raising any question as to the case described by Dr. Webster, I should suppose that in the presence of a streptococcus infection of the kidney, the finding of streptococci in the case was no proof that the streptococci came from some distant source. I should be very sorry to believe that we must hold the tonsils and teeth responsible for a great majority of these pyelitic infections.

One thing I would like to ask Dr. Webster: As Dr. Kolischer has said, the obstruction in most of these cases is not in the pelvic part of the ureter, and I cannot understand exactly how the diagnosis can be made by a vaginal examination. I cannot see just the importance of vaginal examination in making the diagnosis.

DR. IRVIN S. KOLL: I hesitate to speak upon this subject because I have talked about it so often and in so many places. I feel, when discussing the subject of pyelitis, in Chicago, particularly its treatment, that I am talking in hostile territory. It is a notorious truism that one's local colleagues are always loath to take up anything that deviates from the old, hackneyed routine. Five or six years ago I worked upon the colon bacillus, and its infections in the urinary tract, and found, I think, a therapeutic measure that I have published a number of times, namely, the use of the solution of aluminum acetate of the National Formulary. I am fortunate in having my findings borne out by some fifty members of the American Urological Association—none in Chicago; fortunate, because I feel that the reports coming from these men mean a great deal possibly in helping me verify my findings.

It is a biological axiom that the best way to combat a bacterium is to change the action or the reaction of its native culture medium. We know that the colon bacillus flourishes in the lower intestinal tract, where the intestine is bathed with the intestinal and pancreatic juices which are strongly alkaline in reaction, until a high degree of fermentation takes place, when, of course, it becomes acid, but it flourishes before in the alkaline medium. Notwithstanding the fact that in colon infection of the kidney and bladder the urine of these infections is slightly acid, I thought that if we increased this acidity we might get rid of the organism more quickly than by means of therapeutic measures that we have used heretofore. In looking about for a drug that would have some penetrating power, that would be non-corrosive and at the same time strongly acid, I fell upon the solution of aluminum acetate.

I am strongly opposed to drawing too definite conclusions from what we find in the test-tube in the laboratory, because it is a long way from the laboratory to the clinical patient, yet we must base some conclusions upon our laboratory findings. The time-honored nitrate of silver, first in its very weak solution, is shown bacteriologically in the test-tube to have little or no effect upon the colon bacillus

when it is virulent. In the tissues it has practically no penetrating power.

I know some of our capable men do not believe in the penetrating power of drugs in the tissues. I don't think this conclusion is definitely borne out by a number of other very good investigators, however. I do think we have some penetration of tissue by drugs.

The use of nitrate of silver in strong solution is distinctly corrosive, consequently, instead of getting a penetration of tissue, the superficial layer is corroded, and I will venture to say that should I compare my results in colon infections treated with aluminum acetate with those treated with nitrate of silver and other drugs, you would find that the number of treatments necessary to rid a urine of the bacterium—and that is the all-important point—is much less. With the use of water and rest in bed, the clinical symptoms will disappear, but that is not a cure. It is a long way from a cure. Just as long as you have a bacterium in the urine, just so long you run the chance of getting a recurrence, and you are going to get it sooner or later.

Some subsequent work on the pathology—experimental infections,—of colon infections of the kidney leads me to make a very definite statement, namely, that there is no such thing as a pathological entity of pyelitis. It is always a pyelonephritis. The pathology never remains in the pelvis of the kidney, but always extends into the parenchyma. That is the reason, I think, that so often there is a failure in our therapeutic results that ultimately will lead us to surgical interference.

Dr. Emil Ries: I wish to emphasize an impression which I have gained here, namely, the general feeling that we know nothing about pyelitis (laughter), and that we have all come to learn. I regret that I cannot go home with the comfort of feeling that the question is settled. Far from it. The theories which have been brought out are not new, and those that are old are not good. For instance, it has been brought out that the most frequently found infection of the pelvis of the kidney is due to the colon bacillus, and we have been told that the colon bacillus migrates from the colon, ascending through the healthy wall, gets into the lymphatics, and passes along the lymphatics of the ureter up into the pelvis of the kidney and there begins its destructive work. Now who has ever seen a colon bacillus that was so good-natured that it would start from one place, go to another along the lymphatics, still continuing harmless, and suddenly appear in a third place, for instance the pelvis of the kidney and there behave badly? How do you explain that the colon bacillus can start out through a healthy bowel wall and go through half a foot of tissue, never leaving a trace behind, and then suddenly start to be pathogenic in the pelvis of the kidney? There seems to be some break in the theory somewhere.

On the other hand, we have been assured that there is frequently great difficulty in differential diagnosis between appendicitis and pyelitis; in fact, that the symptoms are so similar that it is often difficult to make a differential diagnosis. On examining a great number of appendices that have been removed with malice aforethought as normal in the course of laparotomies for other purposes, I have found that a great many of these appendices that looked perfectly harmless are by no means normal, even if removed with the greatest possible care, so as not to injure them. I have found that the epithelium is damaged in many places. The appendix, being a rudimentary organ, very often is not absolutely normal. You frequently find defects in the mucosa, and through these defects there is opportunity for the germs contained in the appendix to invade the underlying tissue. But is it our experience that from there the colon bacillus, the most frequent inhabitant, would go on and make trouble in a distant organ, or is it our experience that most frequently the appendix itself becomes the seat of trouble? I should say, usually the appendix becomes the seat of noticeable trouble. However, assuming that such an appendix admits the colon bacillus to the underlying tissues, and thereby to the lymphatics, is it not the logical thing to cut the Gordian knot by removing that appendix in addition to your other treatment?

We have frequently heard discussions of bacilluria preceding the pyuria of pyelitis, and this is a very much to be desired discussion and investigation, namely, as to the length of time for which a bacilluria can exist without causing symptoms, until, in consequence of stagnation in the urinary system, produced, for instance, by pregnancy and the pressure of the fetus, the bacilluria develops into a pyuria and pyelitis. We have no exact knowledge on these points. However, from many observations it seems likely that if not all, then at least very many of these patients who later on show pyelitis originally have had a bacilluria. Where do they get their bacilli? How do the bacilli gain access to the rest of the body, broadly speaking? Possibly through the appendix, with its microscopically small defects. Not likely through the tonsils or teeth, because they are not usually inhabited by the colon bacilli. If that is correct, and you find the patient with a mild pyuria, or even a bacilluria, to cut the Gordian knot by removing that appendix as to remove the tonsils for similar reasons. I have acted on that principle occasionally, and can report the case of a lady who is now in the eighth month of pregnancy on whom I operated when she had a slight pyelitis in the third month of pregnancy. I removed the appendix. Examination of the appendix revealed very minute lesions, enough to admit bacteria to the underlying tissues. The pyuria disappeared entirely after the operation. She has not even a bacilluria now. I have done the

same thing in other cases, with successful results.

One other thing: I would like to observe these cases for about ten years, because most of the cases of pyuria which are cured of the discharge of pus still retain bacilli, and where ultimately even the bacilli have disappeared, and the cases seemed perfectly normal for some time, the condition has recurred months and years afterwards. It seems to be one of the most difficult things to cure a case of bacilluria completely, and those who have had occasion to observe their cases for years will probably make the same observation.

Now, as to the question of drugs affecting the bacilli in pyelitis, which was raised by Dr. Koll. He and I have had several discussions on this point. From what we know about the penetration of disinfectants (I will only speak of disinfectants) in any field of surgery, we have come to a point where none of us believe in it. How can anybody prove that any of these disinfectants penetrate, or, if smeared on the surface will reach the deeper layers? All the experiments that have been made with blocks of agar-agar or such substances do not prove a thing for the living body.

DR. H. W. PLAGGEMEYER, Detroit, Mich. (by invitation): I wish to mention one case in regard to Dr. Webster's paper and Dr. Heaney's discussion. This patient was a multipara, I saw with Dr. Peterson, of Ann Arbor, six weeks ago, who was sent in with the diagnosis of appendicitis. At that time I could find no rigidity over McBurney's point, but did find rigidity over the back. On catheterization, which was done with some trepidation, a fairly well-defined hydronephrosis was found of 25 c.c., with definite colon infection. This was, of course, drained, and no other therapy employed. The patient has gone on now to about term with no recurrence of the symptoms. Whether relief was due to the mechanical removal or not, I cannot say.

I would like to ask Dr. Brennemann if, in cases of apparent hematogenous infection, he has noticed any preponderance of kidney pelvis cells over the relative amount of cells in the urine? I have noticed this, and wondered if others had also. I wondered if it would be of any special value in leading to the cause of the infection, if the cell relationship between hematogenous infection and infection from below could be standardized in any practical way.

DR. GUSTAV KOLISCHER: Dr. Ries asked why the colon bacillus loses its good nature all of a sudden in the appendix and instead of producing an inflammation of the cecum, travels to the kidney. Why does the streptococcus in the blood produce a malignant phlegmon somewhere else and not always an endocarditis? We know, from post-mortem findings after animal experiments, that the colon bacillus will travel through the bowel and enter the lymphatics. This has been proven by Bauereisen, Eisendrath, and others. That germs occasionally

lose their good nature is very well known. Why does a streptococcus for years and years lead a saprophytic existence in the vagina, and all of a sudden flare up and become virulent. Is it the privilege of a streptococcus? And if there are such minute lesions in the appendix as Ries mentioned, is there not a possibility that this colon bacillus may travel up to the kidney?

Dr. L. W. Bremerman: I cannot allow one statement made by Dr. Curtis to go into the records unchallenged, namely, that the cystoscopist is notoriously careless in his technic. I have seen a great many cystoscopists work—possibly in every city in this country—and it has been my observation that they are notoriously careful in their technic. I believe that most men in this specialty realize that the process of cystoscopy and ureteral catheterization should be considered as a major surgical procedure, and every precaution is used in performing these operations that is used in performing a major abdominal operation.

Dr. J. Clarence Webster (closing the discussion on his part): I wish to make clear certain points which have been referred to by various speakers. Dr. Bacon evidently did not quite understand my remarks in reference to the palpation of the ureters by vaginal examination. In normal conditions it is practically impossible to feel the ureter with the finger. When, however, it is inflamed, its course may be determined for nearly two inches, either by vaginal or rectal examination. When the wall of the ureter is thickened, it may be felt very distinctly. This is very characteristic of tuberculous infiltration, but is also found when the infection is due to other organisms.

In many cases of pyelitis the lower end of the ureter is infected, though, of course, this is not always the case.

Dr. Kolischer has referred to the pressure of the fetus as an influence in causing interference with the flow of urine through the ureters. Many years ago this factor was considered important by various workers who were trying to explain the causation of eclampsia. Inasmuch as the fetus is a portion of the uterine swelling of pregnancy, it shares in the production of the general increase in intra-abdominal pressure, but I place no importance on the statement that the fetus may interfere with the flow of the urine through the ureter by pressing directly against it. The attitude, position and presentation of the fetus change too frequently in pregnancy to cause marked or long-continued pressure against the ureter.

Dr. Kolischer believes that backward urinary pressure (*Harnstauung*) is an important etiological factor in the production of pyelitis. If it is, is it not remarkable that the disease is not more common in pregnancy? It is highly probable that backward pressure as a result of the development of the pregnant uterus occurs in some degree in a large per-

centage of pregnant women—in a far greater percentage of cases than those in which pyelitis occurs.

Dr. Bacon has spoken with regard to the influence of focal infections in causing pyelitis. I am of the opinion that these are of more importance than has hitherto been considered, both in pregnant and non-pregnant women.

I have had very clear evidence of pyelitis being caused by a streptococcus from a nose and throat infection. The bacteriology of the case was carefully investigated by Dr. Rosenow. It is possible that most of the cases of non-colonic pyelitis may be caused by distant focal infections.

I am much interested in the hypothesis that the appendix may be the cause of right-sided pyelitis. When one bears in mind the great frequence of chronic appendicitis in women (generally not so marked as to cause noticeable signs or symptoms), it is easy to suspect this structure. It may be in very close relationship with the ureter, and infection might pass directly through the peritoneum or subperitoneally through the lymphatics. In most of the cases of pyelitis which I have seen, no evidence of appendiceal trouble could be determined.

Dr. Ries has referred to the subsidence of an acute pyelitis after removal of the appendix. This does not prove anything. Occasionally an acute pyelitis will subside very rapidly without any surgery or local treatment.

I have several patients with chronic pyelitis from whom I have removed the diseased appendix as well as the diseased genitalia and the pyelitis continues, though all the best varieties of treatment have been carried out.

Vaccine treatment has been of value, in my experience, especially in early cases of pure colon infection, but I doubt if it has been more efficacious than mere hygienic treatment. In old chronic cases, especially those associated with an enlarged renal pelvis, and in those cases in which there is a mixed infection, I have found vaccine treatment most unsatisfactory.

With regard to lavage of the ureters and renal pelvis with antiseptics, I agree with Dr. Kolischer that it is a futile method, and one which is apt to do harm. We have abandoned this procedure in treating the infected uterine cavities as well as other cavities which are more easily accessible than the ureter. The temporary trickling of an antiseptic stream can have no germicidal effect whatever. It is diluted by the urine which is passed, and soon escapes into the bladder. It cannot penetrate the infected tissues of the mucosa. The only possible value to be obtained from irrigation of the ureters is in those cases where there is some blocking from fibrin or cast-off cells causing distress to the patient by interfering with free escape of urine into the bladder. I have relieved a patient in this manner. This complication is not very common in ordinary pyelitis cases, and lavage is therefore rarely called for.

Even in the hands of the most expert, the passage of the ureteral catheter may cause abrasion of the mucosa, with consequent danger of extension of infection. Sometimes, even the ureter may be perforated. I saw a case in which this accident occurred in the hands of one of the most expert urologists in America. When he injected collargol it passed not into the renal pelvis but through the wall of the ureter into the periureteric tissue. Leakage of urine followed, and it was necessary to perform lumbar nephrectomy to save the patient's life.

DR. CLIFFORD G. GRULEE (closing the discussion on his part): I purposely did not dwell on the subject of etiology or path of infection or treatment, because I had thought over the thing pretty thoroughly for some time and had not come to any definite conclusion about these points. There are two or three things I will say in this regard, however. Before I prepared the paper for this evening, I looked over my cases of the last three years at the Presbyterian Hospital and found eighteen, of which four were in boys. Of the eighteen, three died—all girls.

In answer to the statement of Dr. Brennemann that practically all deaths were due to septic infections of the kidney, I will relate one case which went to autopsy, and which Dr. Kretschmer saw. This little girl was in excellent nutrition; developed a pyelocystitis while in the hospital, and died in an acute septic condition. Autopsy showed only a slight inflammation of the pelvis of the kidney, ureter and bladder, but the liver resembled a mold of butter. The toxicity had been so severe that it produced this marked fatty degeneration of the liver. So that I do not think we can regard the condition as only an infection of the kidney, when the result is fatal. There was no other focus of infection found in this case, and it seemed that the infection of the pelvis, ureter and bladder was to blame for this condition.

As to the route of infection: I have thought a good deal about this, and the first thing I thought of, like many others, was the hematogenous theory, so in seven or eight of these children we did blood cultures. In only one case were we able to get a positive culture of a colon bacillus, and that case was running a distinctly typhoid course. Of course, we know that the blood has a decided bactericidal effect on the colon bacillus, and that is not a definite argument against the colon bacillus acting from a hematogenous source.

As regards the question of ascending infection, contrary to Dr. Brennemann's experience, it has seemed to me that there was no danger from catheterization of these children. It has been a routine practice of ours to make cultures and get the colon bacillus. In an effort to find out whether the colon bacillus was present in a location where it might invade the bladder we made routine examinations throughout the ward at one time to find if the

colon bacillus was about the opening of the urethra, and in every instance in these girl babies we found it. It seems to me that that is an argument rather against than for ascending infection, because if we can always get a colon bacillus in that region, it would mean that it would take a special colon bacillus to produce the disease.

As to the lymphogenous route, this much can be said: It is not usually taken into consideration that the contents of the bowel are truly outside the body, and that until there is some absorption from that bowel, the content of the bowel is not within the body. A colon bacillus may penetrate a bowel, it seems to me, if there is some disturbance of continuity of the mucous membrane of that bowel. So I do not think it is outside the realm of possibility for the colon bacillus to penetrate a bowel which might to all intents and purposes, be normal.

I have had the distinct impression that many of the cases of colon bacillus pyelocystitis have occurred in what we term exudative diathesis, a term which is probably not well known to many of you here, but it is a condition where there is a distinct tendency to a desquamation of the epithelial cells from the mucous surfaces of the body. This can be definitely proven in a perfectly normal child who shows a cradle-cap. If you examine the urine, you will find a very marked increase of epithelial cells. It may not be confined to such surfaces as those of the bladder and pelvis of the kidney; perhaps the mucosa of the intestinal canal may be so affected.

I have not arrived at any definite conclusion as to the route of infection in these cases. However, I think it might be a very plausible explanation to say that it might come through the lymphatic tissues from the large bowel.

As to the question of focal infection, focal infections do occur in young children, and are sometimes followed by urinary and kidney involvement. My experience has shown that the usual result of these focal infections was rather an acute hemorrhagic nephritis than a pyelocystitis.

As to the question of how soon bacilluria produces symptoms, I cannot answer that.

Regarding the number of pus cells, it has been questioned whether that was really of practical value in prognosis. All I can say about that is that we have been making routine examinations of the number of pus cells in the urine in these cases for several months. It has been done by the method I described, which is very simple. We have found that in practically every instance where the temperature has gone up the night before, in the morning specimen of urine we would find an increased number of pus cells. It may be that plugging of the ureter produces this rise in temperature, but, of course, when the discharge of the pus cells comes, they must be there in greater abundance. I did not mean to make the statement that the number of pus cells was any indication as to the severity

of the condition, but I do think that the course of the disease may be followed very well by examining the pus cells in the urine.

One thing more as to treatment: I do not believe that urotropin is the treatment *par excellence* in this condition. I usually start out for four or five days with a distinctly alkaline treatment, and later on change to urotropin.

I have used autogenous vaccines in a routine manner, in an effort to prevent recurrence of infection, and not to change the course of the acute condition. In no instance have I been able to persuade myself that these autogenous vaccines had any influence on the question of recurrence. I thought so for three or four years, until reports came in, and then I was very much chagrinned about statements that I had made formerly regarding the vaccine treatment of these cases.

DR. EMIL RIES: Dr. Kolischer could have gone further in his remarks and could have pointed out some more difficulties in the pyelitis question. I have put before you two possibilities. One was that the colon bacillus gets out of the appendix, into the lymphatics, into the sheath of the ureter, into the pelvis of the kidney, and makes trouble in the pelvis of the kidney. It has not made trouble on its way. That is queer. On the other hand, I have said that I have taken out the appendix to prevent the colon bacilli entering the system through minute lesions in the appendix. I did not say how they got into the pelvis of the kidney. He could have tackled me there. What do we know about it? We know that if the colon bacillus gets out of the bowel into the surrounding connective tissue and lymphatics, we usually get inflammation. Now, it is not likely that the colon bacillus will go through all that tissue without making infection. On the other hand, if the colon bacillus gets through minute lesions of the appendix into the blood stream, it can live in the blood stream without causing much trouble, on account of the bactericidal power of the blood, and cannot produce trouble until it gets out of the blood stream into some other place, for instance, the pelvis of the kidney. But why there? I have not explained that, and I cannot. Also, it is queer that if a connection between the appendix and pelvis of the kidney is to be established, it should be a hematogenous connection, and not affect both kidneys equally frequently. If the colon bacillus getting out of the lumen of the appendix into the blood stream were the cause, then there should be as much probability of its getting into the left kidney as into the right. But as a matter of fact, it gets into the right kidney much more frequently, and that agrees much more with the theory of its marching from the appendix along the lymphatics on the right side.

I gave a theory, and Dr. Kolischer is right in pointing out the weak points. On the other hand, it is entirely unnecessary to point out that a micro-

organism may be virulent in one locality and not in another—for instance, in the appendix and not in the blood stream. It is, also, not correct to state that a ligneous phlegmon caused by a streptococcus is not associated with endocarditis. In ligneous phlegmon a frequent cause of death is septic endocarditis—there is no question about that.

Dr. Arthur H. Curtis (closing the discussion on his part): A remark of Dr. Grulee's reminds me that I was referring to the use of vaccines in chronic cases, but not in acute cases. In the present state of our knowledge of vaccine therapy it is doubtful whether it is advisable to use them in any but chronic infections.

Dr. Herman L. Kretschmer (closing the discussion): Dr. Kolischer said that before an accurate diagnosis could be made in these cases of cystitis or pyelitis in children, an examination of the bladder must be made. I have had occasion to examine five children in whom a diagnosis of colon cystitis had been made. Cystoscopic examination showed the infection coming from the kidney in each instance.

Those of you who are familiar with the very convincing anatomical work of Francke, must naturally agree with him that a great many of these infections are lymphogenous in their origin. Francke has shown the lymphatic connection between the large bowel and appendix in some instances, and the capsule of the kidney. Coupled with the work of Francke is that of Stahr. In this way we have a direct connection between the large bowel and kidney.

We should bear in mind that in a great many cases of pyelitis in children we obtain a history of previous or recent attacks of gastroenteritis; the possibility of having lesions of the bowel through which the colon bacillus can wander up the lymphatics, is to be considered; it is easy to see how these children can have colon pyelitis following attacks of gastroenteritis, in view of Francke's work.

Asch, working along opposite lines in dogs, administered opium, locked up the intestinal tract of the dog, and in his cases colon infection was demonstrated in the urine. All Asch did was to open up the bowel with laxatives, and the colon infection disappeared. That, I think, would also be an argument in favor of the lymphatic origin, based on Francke's views.

The recent work done by Sakata, Sweet, Bauereisen, and others, also demonstrates a lymphatic connection between the bladder and pelvis of the kidney.

I was glad to hear Dr. Kolischer make the statement with reference to the drainage and the effect of passing a catheter draining these cases. In two cases in which the patient had large quantities of pus in the urine we simply cystoscoped them and catheterized them for cultures. Following this they had no more trouble. The pus disappeared from

the urine; in all probability, we dilated the ureter, afforded better drainage, and hence the pus disappeared from the urine.

In my opening paragraphs I made the statement that I was giving the results of treatment used. I made no claim for silver nitrate. All I can say in answer to Dr. Webster is this, that these patients were treated at the time the treatment was begun they had pus and colon bacilli in the urine; when we finished (and those cases were carried along far enough), the urine was free from pus and the cultures were sterile. Whether that was due to the silver nitrate or instrumentation, I do not know. I am just giving you the results of treatment.

It is very true that some advocates of pelvic lavage treat their patients by lavage with salt solution, boric acid and oxycyanide of mercury, and get just about as good results as anybody else.

Dr. Bacon said he never saw a very severe case. I wish to mention one case, in a pregnant woman, in which the temperature ranged from 96° to 105°.

I was glad to hear Dr. Bacon say he did not believe these patients should have their uteri emptied. That is the point I wished to make in my paper. In two of the cases I saw the patients consulted obstetricians, who advised immediate emptying of the uterus, and both cases went on to a full-term pregnancy.

Dr. Charles S. Bacon: I have seen pretty severe cases, but none that needed any other treatment than I referred to. I did not mean that I have never seen any severe cases.

SOME STUDIES ON THE ANATOMY OF THE RENAL PELVIS.*

By Daniel N. Eisendrath, M. D., Chicago, Ill.

This is not a purely anatomical paper, but one that has considerable clinical importance. As you know, the operation of pyelotomy is the one of choice today in the removal of renal calculi, so that we have a great many points to consider in the anatomy of the renal pelvis which we did not have to consider when the operation was in its infancy. For example, it has occurred to me, and in converstaion with Dr. Young, he told me he had had a similar experience, that in doing a pyelotomy I accidentally wounded a vein so severely that the bleeding from it was incapable of being checked by suture or anything else, and thus necessitated nephrectomy. In Dr. Young's case, after a good deal of effort, he succeeded in checking the hemorrhage from the vein.

At the same time, the teaching has been that the reason why pyelotomy through the posterior aspect of the pelvis is the operation of choice is that there is practically only one artery there, and that artery comes off from the renal artery, goes directly to the posterior aspect of the pelvis, and then goes into what I call the normal or high type of retropelvic artery—one which passes along just about at the junction of the renal pelvis and of the parenchyma of the kidney, or in other words, at the junction of the sinus proper and of the renal pelvis. That is the high type—the normal type. But in investigating (and this occurred to me clinically, also), I found that this was by far not the only type of renal artery, that one had to look out for other forms of retropelvic arteries. There is what is known as a middle type, where the retropelvic artery comes off directly from the renal artery and then crosses the middle of the posterior aspect of the pelvis, where one has to be very careful not to injure it in making an incision into the pelvis, especially when you think of its being mixed up with the fat and imbedded in the peripelvic fatty tissue. Then there is a third type, known as the low type. I have given these names to these types. No article has ever appeared on this subject, so far as I can find. This low type crosses just about the junction of the ureter and pelvis, on the posterior aspect—not on the anterior aspect; but those that come directly from the renal artery pass across the pelvic artery of the pelvis.

[Illustrations were shown, which were taken from specimens in the dissecting room of the University of Illinois, through the kindness of Dr. Rupert, who placed all his specimens at the speaker's dis-

*Read before the Chicago Urological Society, April 13th, 1916.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, June, 1916.]

posal, and then a large number through Dr. Springer, the Coroner's Physician, and some at the Michael Reese Hospital in the autopsy room.]

The typical retropelvic artery was shown in the first specimen. Also some of the different types of pelvis. Sometimes, instead of there being a middle pelvic artery, we have either the high and low combined or the middle and the low. Some of the specimens show that.

Another illustration shows still more variations. Occasionally the retropelvic artery, instead of coming off from the renal artery, comes off directly from the aorta as in one of the specimens, which is of importance. If it tears off during operation, and bleeding from the depth of the aorta occurs, it is hard to check.

Another specimen shows a retropelvic artery coming off directly from an accessory artery—also a very important thing, in case it happens to get away from you when operating.

So much for the retropelvic arteries. I will speak of statistics in just a minute.

A third series of illustrations were made from about 138 kidneys, and consider the question of the renal vein. That interests me especially, on account of having had a severe hemorrhage in one case. We have found some very interesting conditions, as regards the renal vein, in our dissections. At times the principal renal vein, instead of passing in front of the pelvis, will pass behind it, so that there will be no renal veins in front of the pelvis at all, but the entire large renal vein will divide opposite the renal pelvis into two or three branches.

Another interesting point is that the renal vein, instead of being the entire renal vein on the posterior aspect, will occasionally divide into two branches, the main one going in front and the other, almost equal in size, going behind it. This means that we have got to get away from our feeling of safety in doing pyelotomy, so far as the dangers of hemorrhage are concerned.

Regarding frequency, so far as arteries are concerned, I found in 68 kidneys which I dissected for the arteries, in which work Dr. J. Kahn assisted me, that the high type occurred in 82 per cent., or 56 cases; the middle artery occurred in 6 per cent., or 4 cases; the low type in only 1.5 per cent.; middle and low combined in 4.5 per cent.; high and low in 3 per cent.; direct from the aorta, 1.5 per cent.; from the accessory artery, 1.5 per cent.; all of the renal veins were retropelvic in 6 out of the 68 kidneys, or over 9 per cent. Just think of how much importance it is to know that one anatomic point. There has never been any research on this subject before, because the operation of pyelotomy is comparatively recent. The renal vein divided into two main branches, one of these retropelvic, in 4 cases, or 6 per cent. One thing I did not mention, namely: The retro-

pelvic vein in one case came directly from the vena cava. So much for the arteries and the anomalies.

Thus, we are safe in about 82 per cent. of the cases with the usual instructions the books give us in regard to retropelvic arteries.

As regards the renal pelvis, that is of considerable importance in the surgery of stone. You may have a case in which you think you have searched diligently. You open the main renal pelvis, because the general teaching has been that there is what is known as the ampullary type, and that the bifid and trifid types are extremely rare, and you have looked at the whole pelvis, you think. I was interested to see what proportion of cases would be of the ampullary type, and what proportion of the bifid and trifid types. In one case, had I not known of these conditions, I think I would have missed one stone.

In the fetus the pelvis is an ampullary affair. We made a dissection of a number of fetal kidneys, and they were all injected first with bismuth paste, and then X-rays taken. In the fetus the kidney is a diffuse affair. There is comparatively little parenchyma in the fetal kidney; it is mostly a pelvis. (Here the speaker showed X-ray pictures of the ampullary type.) Normally, in the ampullary type, we have a relatively large sac, that you know holds about 4 c.c., that gives off a superior and inferior calyx, and then very frequently a middle calyx. Here are all the different types of ampullary pelves (illustrating).

Studying this further, we find, in a few of the cases that the pelvis has this typical form, with two relatively small calyces, and there is no ampulla itself, although the ureter divides almost immediately into two horns, so that you can see what a search would have to be made for a stone under these conditions, and how much damage you could do if you did not look into all the corners.

I have a very pretty picture of double ureter and double renal pelvis, showing that they were quite separate. I had two cases like that last summer, one in which the condition was pathological in one half, and not in the other.

I have here some preparations that we made by injecting bismuth paste into the ureter, filling up the renal pelvis.

These are all ampullary types of pelves, with the exception of this one (indicating). You can see the relation of the vessels on the anterior aspect to the renal pelvis. This is just the early stage of a bifid pelvis.

As regards the frequency, we examined 157 kidneys with reference to the types of pelves. There were 138, or 87.8 per cent. of the ampullary type, showing a large proportion, 16, of the bifid type, which shows they occur often enough to think of—10 per cent. of the cases. There was a percentage of 2 of the trifid type—3 cases. The only work

that speaks of the frequency of the different types of pelves is one that is quoted by Binney, of Kansas City, in a work published in 1907. They speak of the classical or ampullary occurring in about 30 per cent., but our work is really the first one that has put this on a little more accurate basis, namely, the occurrence in pretty nearly 88 per cent. of the cases, of the ampullary form; 10 per cent. of the bifid, and 2 per cent. trifid. Even so recent a work as Kelly's—and there is no better work than that—does not mention any other type of pelvis but the ampullary. This is not only of anatomical interest, but to those doing kidney surgery it is a matter of considerable importance to know the anomalies of the veins, and also the different types of renal pelvis.

SURGICAL TREATMENT OF ACUTE EPIDIDYMITIS.*

By Charles Morgan McKenna, B. S., M. D.,
Chicago, Illinois.

There has been much discussion regarding the surgical treatment of acute epididymitis without any definite conclusion. I wish to submit this paper and the results of a limited number of cases, worked out at St. Joseph's Hospital. Just a word about the anatomy of the epididymis and its surrounding structures. It will be remembered that the epididymis and testes are enclosed in the same sheath, namely; the tunica vaginalis. The nerve supply to these two organs is the same, being derived from the aortic and renal plexuses. Upon a close dissection, it will be found that the nerve endings are more superficial in the testes than they are in the epididymis. The area covered by the testes is far greater than that of the epididymis. Since these are the anatomical findings, we must take into consideration the pressure on the testicle as well as that of the epididymis.

In acute epididymitis, we find the beginning of a hydrocele or fluid around the testicle. All the fascias between the skin and the tunica vaginalis are upon the greatest tension. The tension is so great that the fascias can be heard to make a crackling noise upon dividing them with a scalpel. Dr. G. Kolischer and the writer demonstrated this on a number of cases two years ago. Hence, it is not enough to simply divide the fascias and open and drain the epididymis, but it is quite necessary to separate the fascias one from the other, and especially separate the tunica vaginalis from the testicle proper. If the wound were closed at this stage of the operation, the patient would be greatly relieved of pain, as will be shown later in this paper. The question that always arises, Is the patient more likely to be made impotent by opening the epididymis or not? I should always answer in the negative. It will be remembered from the anatomy that the epididymis is nothing but a canal or tube, made up of transverse chambers. When the patient is suffering with the above named pathological condition and after a careful dissection, the tube stands out very clearly so that the operator can easily puncture the posterior wall of the affected chamber without doing any injury to the small tubules coming off from the testicle.

I wish to mention here that in operating a number of cases for short circuit of the vas deferens, the lowest most part of the epididymis showed the seminiferous tubules to be closed and this part of the epididymis to be a hollow tube without any

*Read before the Chicago Urological Society, April 13th, 1916.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, June, 1916.]

spermatozoa; on further examination, the tubules coming from the testes were blocked. This, of course, was due to the infection at the time of the acute condition not being relieved by operation and nature had to absorb the pus within the lumen and, as a result, the above condition exists.

Since this is the result, it was my reasoning that the patient would less apt to be impotent if the pus were drained off before the stenosis could take place, hence leaving the tubles and main canal open into the vas deferens. Many patients who suffer with acute epididymitis, and are treated in a palliative manner, afterwards are often capable of passing living spermatozoa. This, of course, is due to the lessened amount of inflammation in the epididymis and the amount of free pus in the vas, which is absorbed by nature at the time of the infection. The only good reason for operating in this class of cases is due to the excruciating pain that they suffer at the time, and the intensity of pain is indicative of the amount of free pus in the epididymis and the amount of inflammation surrounding the testicle.

The following is the report of eleven cases treated in different ways for the relief of pain. The first four cases were treated by cutting down on the epididymis and putting a gutta-percha drain in the lumen. These four cases were greatly relieved of pain, but it was from fourteen to twenty-one days before the entire swelling was relieved. In four cases, the epididymis was exposed by careful dissection and the different fascias divided one from the other and the epididymis drained. In those cases, the patients were entirely free from pain and the wound healed and the swelling disappeared within eight days. In two cases the dissection was made complete and the fascias separated from each other, and the epididymis was not punctured for two days. Both cases had immediate relief from the general pain, but complained of a sharp toothache-like pain in the testes. In the last case the incision was made on the opposite side, allowing the free fluid to escape from the tunica vaginalis. In this case, the patient was greatly relieved of pain, but not entirely so. Two days later with a local anesthetic the epididymis was opened and drained and the patient entirely relieved of pain.

It may be well to mention here that doing what is commonly known as a blind stab operation is not at all to be recomended, because it is quite difficult to do this operation and be sure to separate the posterior wall of the epididymis without plunging the knife into the tubules coming off from the testicle on the opposite side. To make a blind stab, even though the patient does get relief is not satisfactory.

Conclusion. Surgical procedure is only necessary when the patient is suffering excruciating pain. When this procedure is carried out, it is quite neces-

sary to divide the fascias so as to free the tension from the testicle as well as the epididymis. Patients are less apt to be impotent if the posterior wall is divided carefully and the pus drained off than if it is left to nature to absorb. A blind stab operation is that of a faker and should not be considered. It is not enough to expose the epididymis and drain it, but all the fascias should be free.

It is not necessary to split the entire epididymis, but only the infected chamber, which stands out clearly.

25 E. Washington St.

NOTES ON URETERITIS.*

By Harry Kraus, M. D., Chicago, Ill.

Inflammation of the ureters, although of great clinical and diagnostic importance, is rather scantily treated of in the literature. This is partially due to the fact that this condition as a rule is overshadowed by the concomitant pathology in the other urinary organs, and also to the failure to recognize its importance as a pathologic factor. It may also be stated that this condition is frequently overlooked because in most instances its presence is revealed only by a careful and more or less elaborate diagnosis. It may be stated at the outset that ureteritis only exceptionally presents an independent clinical entity. It is, as a rule, either dependent on general conditions, or caused by localized infections of the upper urinary tract.

Pregnancy is one of the conditions that in a great percentage of cases will lead to disturbance in the circulation of the ureter and in consequence, will make it more susceptible to microbic invasion. Edema of the ureter is caused either by pressure of the enlarged uterus *in toto*, or by the pressure of a fetal part against it.

That such a pressure on the ureter exists is proven by the fact that ureteral soundings in a certain percentage of pregnant women show an obstruction in the abdominal part of this tube. This compression of the ureter very easily explains that the edema will involve its entire length. The existence of this edema may be recognized and proven by clinical evidence. The ureteral vesical end shows signs of edema and in these cases there always is a diminution of the ureteral flow and extension of the intervals between the urinary jets. The passing of the ureteral catheter beyond the point of obstruction does not change these phenomena; consequently it is reasonable to assume that the edema extends over the entire length of the ureter, while the commutation of the urinary expulsion must be attributed to the edema in the renal pelvis interfering with the contractive energy of the ureter. That this interference with the circulation often leads to infection and inflammation, becomes evident from the fact that in a certain percentage of these cases the ureter concerned on palpation appears as a thickened hard strand of excessive tenderness. If such an inflammation becomes very well developed the vesical end of the ureter appears in the cystoscopic picture as a prominent ridge, which, if transilluminated, presents itself as a dark red shadow. That the ureters quite often become inflamed as the result of an ascending infection conveyed by the lymphatics, was proven by animal experiments

*Read before the Chicago Urological Society, April 13th, 1916.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, June, 1916.]

and post-mortems as quoted in the publications of Baureisen and Eisendrath.

It is interesting to note that on the other hand most of the cases of ureteritis become clinically evident at the lower part, and are due to infections coming down from the parenchyma and the pelvis of the kidney. Most of these infections attack the ureter at different points, and the infected areas are frequently separated by segments of varying length that are perfectly normal. Only in tuberculosis of the kidney the entire length of the ureter becomes uniformly involved, leading to thickening and rigidity of the tube, always followed by a shrinkage as to length. The presence of a foreign body in the lumen of the ureter may lead to a local inflammation, softening of a circumscribed area of the wall, and eventually to sacculation, or to a circular dilation of the ureter above the seat of the obstruction. Those latter conditions can be exactly diagnosed by the injection of contrast fluid, and the subsequent taking of an X-ray picture. The development of a tumor in the kidney invariably leads to circulatory disturbances in the ureteral wall becoming apparent to the observer by changes around the vesical orifice of the ureter.

Obstructions in the parietal part of the ureter, as, for instance, produced by prostatic hypertrophy, may also lead to edema of the lowest part of one or both of the ureters, and if prostatitis or cystitis sets in, this edematous part of the ureter becomes involved in this inflammation, and the ureteral mucosa prolapses, thus giving these openings a pouting and discolored appearance.

TRANSACTIONS

Chicago Urological Society.

The regular meeting of the Chicago Urological Society was held April 13, 1916, with Dr. Gustav Kolischer in the Chair.

The Society was called to order at 8:30 P. M.

"Pathological Conditions of the Epididymis," by Dr. C. M. McKenna. (June issue this Journal.)

Discussion.

Dr. V. D. Lespinasse: The surgery of the epididymis, particularly in acute infections, is one that has come up very recently, and is one that should receive careful consideration. Surgery of the epididymis should be performed relatively more often than it is. The first dictum was that it should be done only to relieve pain, that it should be reserved for those cases where the patient complained of excessive pain, which was not relieved by rest and elevation. This, I think, should be extended a little bit, that is, to forestall some of the later complications.

It is a question in my mind as to whether opening the capsule of the epididymis is a good thing or not for the relief of occlusion of the tube. Experimentally, if you cut the capsule of the epididymis when it is acutely inflamed, the tubules bulge.

When you think seriously on this subject, there are just two things that really require relief: (1) Pain, and (2) the possibility of closing up the epididymis tubule. If the inflammatory condition does not close the epididymis tubule, it has not done any permanent damage, so if the operation does not actually lessen the number of occlusions, it has failed. That is hard to determine. The percentage of occlusions is uncertain. The only real statistics that we have are the old ones that were obtained from some reports of work done in the German army, and they say that forty per cent. of double epididymitis have occlusions, and twenty-five per cent. of singles have occlusions. I think it was Young, of Boston, who had six or seven cases operated upon, and there were no occlusions. I have no statistics to offer from my own work. I never operated on a double acute epididymitis, and so far as the singles are concerned, I have not followed them and I do not know whether any were occluded or not. But this I do know, that the capsule, when it is cut, is replaced by another capsule of scar tissue, and is rather dense and rather hard, and may occlude or not. So in operating I practice the small puncture in each compartment of the epididymis. The epididymis is a group of rooms, and the long axis of each compartment is transverse to the long axis

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, June, 1916.]

of the epididymis. The tubules are coiled in one compartment, and then go through the wall into the next compartment, in a good deal the way the steam-pipes run from room to room in a building. So that when you operate and have the epididymis exposed, notice the compartments that are infected. You can tell them very easily. Make a little incision through the capsule very carefully. The capsule is hard, thick, and you must go through very carefully. When you get through, just put a director in and free it. In that way you make a minimum wound in the capsule. You have a minimum amount of scarring, and if you are careful you will not cut any of the tubules. That relieves pain, and probably lessens the chance of occlusion. If you make large incisions, I think that the risk of occlusion is likely to be increased. As I see it, the whole matter is one of surgical judgment and careful technic.

As Dr. McKenna said, the blind stabs—that is, holding the testicle and just stabbing in—do relieve pain, but it is absolutely impossible to say how deeply you go in and what structures you destroy, and if you go deeply enough you are sure to cut the tubule, and the chances are that it will become occluded. There is less chance of occlusion low down.

The function of the epididymis is more than that of a conducting tube. It has a definite function. It has a definite secretion. It is a thin, rather viscid, glycerine-like secretion. It can be seen very well if you ligate the epididymis at the upper portion, just below the exit of the tubes from the testicle; then let the animal go for a little while, and, if possible, arrange to have the female animal there, let them have intercourse, so that all the spermatozoa are cleaned out below the ligature; later on ligate the vas or the epididymis, leaving a portion entirely occluded. That portion will enlarge and fill up with this viscid, white secretion. This seems to have some function with regard to the nutrition and development of the spermatozoa, and that, of course, is practically never interfered with to an extent that amounts to anything, except from the occlusion. The only place where that comes into play is in the operations for relief of occlusion where the anastomosis is made high up, and there the sperm has remained motionless, and never become motile. So, as Dr. McKenna said, the point of the epididymis to use for the anastomosis is the lowest possible point above the occlusion, and you can usually tell that by simple inspection of the epididymis.

Dr. J. S. Eisenstaedt: My experience in the operative treatment of epididymis is very slight. I have operated probably four or five cases. I really wish more to ask questions than to tell anything. The whole point in regard to the surgical treatment, it seems to me, is whether the likelihood of subsequent sterility is greater following operation than without it, and until we have statistics show-

ing this, I believe that a person can do very well without the surgical procedure. For the simple relief of pain, I think the cases are very, very far apart where one does not control the pain by palliative measures.

Secondly, many of these epididymes do not at any time in their career contain an appreciable amount of pus. Very often it is merely a serous exudate. It may be turbid, of course.

Dr. McKenna stated that after palliative treatment he is no more sure of the percentage of cases in which living spermatozoa are found. That simply is a repetition of the remark that the prime question is whether we are likely to have fewer cases of sterility following operation than without it.

Dr. Irvin S. Koll: I should like to ask Dr. McKenna and those who have done a number of these operations how frequently they have had recurrences following the operation? I have had several. I don't know whether it is my fault in technic or is liable to happen to anyone. I do believe that operation gives some excellent results, so far as the pain is concerned, and have seen a number of cases in which the most protracted palliative measures were of no avail.

Then, another indication I don't believe the Doctor mentioned is in cases of recurrent epididymitis of gonorrheal origin, that I feel should be classified in the indications for the operation.

Dr. McKenna, closing the discussion: I think the remarks of Dr. Lespinasse answer Dr. Koll's and Dr. Eisenstaedt's question very well. He said the need to see which chamber was infected is one of the most important points. The scar tissue will be much less from an incision than if the pus is left to be absorbed by nature. Dr. Eisenstaedt asked if I found pus there often. It is a common thing to find pus, a drop or two, when the pain is excruciating.

As to the question of recurrence asked by Dr. Koll, I have never had a case recur since I have done an open operation and exposed the entire epididymis. I have had recurrences when I used the old method of going in and making an incision through a number of chambers, regardless of which ones were infected. If the incision in the posterior wall is small and the drain carefully inserted, it will be a rare thing to have a recurrence.

* * *

"Some Studies on the Anatomy of the Renal Pelvis," by D. N. Eisendrath, M. D. (June issue this Journal.)

Discussion.

Dr. Gustav Kolischer: Some of the facts brought out by Dr. Eisendrath are very interesting. I see their value more in a clinical way. The number of such abnormalities is surprising. The question is how to protect ourselves and the patients against such mistakes as may occur from not

discovering the existence of such abnormalities. I feel this way about it. I firmly believe that pyelotomy is the operation of choice. But we must keep in mind that in the normal kidney in the adult there is no such thing as a lumen or cavity of the renal pelvis, consequently every time we have to operate on a renal pelvis, we have to deal with an abnormal pelvis, which, of course, puts all the normal insertions of the ureter and blood vessels out of condition. What we have to do is this. If we want to operate on a pelvis at all, the first demand is an absolutely free and clean exposure. In this way we are kept from breaking into a blood vessel. Second, we have to make absolutely sure where the veins are, and how many. It is rather easy to find the artery first by palpating, and, second, after delivery the artery will always appear as a very thin, white band. But it is easy to mistake a dilated vein, especially if bifurcated, or to mistake one of the ramifications in the pelvis of the kidney for adhesions. In order to be sure about that we should never incise a pelvis without taking two precautions, first, to relax our pull on the kidney so as to give a vein a chance to refill; second, we should not incise the pelvis of the kidney without counter-pressure. Quite often you will see a bifurcation; the two veins run over the anterior surface of the pelvis, but if you put your finger behind it against the wall, if you are going to incise, you separate these veins and then you can pull them out of your field of operation. This counter-pressure eliminates mostly the danger of cutting into a vein.

So far as the removal of all the concretions is concerned, there is one golden rule, namely, we have to remove as many concretions as there have been shown on the X-ray plate. We must hunt for them. How shall we do this without destroying the kidney? Insert the little finger tip into the pelvis and with the other finger outside palpate, and in this way you can remove the concretions which may be high up in the calices. If there is any adhesion that is suspicious, it has to be cut between two ligatures.

I want to thank Dr. Eisendrath for the exhibition of his specimens, because it calls our attention to the abnormalities. It is, of course, impossible, even with the most extensive statistics, to cover all the possibilities of abnormal conditions, but if we know such things exist, we can be on the lookout for them.

DR. CHARLES M. MCKENNA: Just a question about the removal of a stone from the kidney. Supposing there are two stones in the kidney and the X-ray shows one in the pelvis and the other in the parenchyma. Where would the incision be made? I have heard this question discussed often without any definite conclusion. Some surgeons seem to think that the best place is in the pelvis of the kidney and the removal of the stone from

below. But if this is done, I think it is necessary that the suture be placed above the upper margin of the incision. This, I am afraid, might leave space for a hematoma to form, and the needle itself going through the body of the kidney also causes a channel for hemorrhage, whereas if the incision is made through the parenchyma and the suture put through just above the pelvis where the kidney material is very narrow, I think the danger for hemorrhage is much less. So far as I am concerned, I have had excellent results by using the latter method.

DR. GUSTAV KOLISCHER: I would like to answer Dr. McKenna's remarks. It all depends on the location of the concretion. If a stone is located in an additional calyx of the pelvis, there is no sense in cutting through the parenchyma, because this necessarily destroys the parenchyma. If a stone is located in the cortex of the kidney, it would be foolish to go up through the pelvis to get the stone. It depends on the location and how much the pelvis and calyces are dilated. Those are two different propositions.

DR. J. S. EISENSTAEDT: I would like to ask Dr. Eisendrath how much help he has derived from pyelography in these cases of various types of renal pelvis?

DR. EISENDRATH (closing the discussion): In reply to Dr. McKenna's question, I agree with Dr. Kolischer that if you have a stone in a dilated calyx, and one in the pelvis proper, then by all means do a pyelotomy, but if you have, as he spoke of, one stone in the pelvis and one in the parenchyma, my own practice has been to make two incisions, one right down on the stone in the parenchyma, and then the second one through the pelvis, and deliver the pelvic one there. There is no rule about always doing pyelotomy in these cases. It is safer to do the way I described. A stone in the parenchyma you can often feel from the surface, so make a small incision and deliver it.

I agree fully with Dr. Kolischer that so long as we know that such conditions as I have described exist, it is of great importance to be on the lookout for them.

I had the same experience with accessory polar vessels, and a great many men later thanked me for having called their attention to the work Dr. David Straus and I published four or five years ago, on the presence of these polar vessels, saying it had saved them from a good deal of trouble. As Dr. Kolischer states, I believe we should always be on the alert for these conditions. We can locate an artery easily enough, but the trouble is with the veins—they collapse.

I was surprised myself when I. saw these dissections and the anomalies of the principal renal veins coming away from the vena cava directly across the posterior aspect of the pelvis. I was glad to know such things exist.

Regarding Dr. Eisenstaedt's question, I think

there is nothing superior to pyelography for identifying these various types of pelves. Braasch has very well shown that in his book.

"Some Notes on Ureteritis," by Harry Kraus, M. D. (June issue, this Journal.)

Discussion.

Dr. D. N. Eisendrath: Dr. Kraus was kind enough to quote the work that we have been doing. It might be of interest to you to know that we have been repeating our experiments to find out if we had jumped to conclusions too soon, or without sufficient grounds, although we had submitted our evidence to very excellent pathologists before publishing the first paper, but we have been doing the same kind of work again, and it will be reported in June. We are finding the same thing, that without any obstruction in the ureter microörganisms—at least, their footsteps in the form of infiltrations—and even the organisms themselves so far as cultures are concerned, will get up into the pelvis of the kidney, by ascending in the wall of the ureter, without involving the mucosa at all, or only in a few places. We have in our last series of experiments, taken the ureters and not missed a single section, all the way up from the bladder into the kidney proper. It takes about 700 sections for a dog. Each one has to be studied, and we are more convinced than ever that we are on the right track, and it corroborates what Dr. Kraus has brought out in regard to pyelitis of pregnancy, and not only true of pregnancy, but also of the puerperium, and of the pyelonephritis that occurs in children, and, for instance, in an ordinary cystitis with or without obstruction, namely, that infection will go up the wall of the ureter and will cause a ureteritis there, which will seldom or never cause any symptoms.

A statement was recently made by Chute, which I also observed clinically, that when you get these chills and fever in urinary infection, they are rarely, if ever, due to any absorption from the bladder wall. They are usually the result of absorption from the kidney proper. Since doing this work I can easily understand how easy it is for infection to go directly through the lymphatics, up from the bladder into the ureter, and up along the pelvis of the kidney, and into the kidney proper, as Bauereisen has shown. It may interest Dr. Kraus to know of some work that was done by Oehlligger, of Hamburg, in demonstrating by means of collargol pictures that in pregnancy the right ureter is two or three times the size of the left ureter.

Here is another point that has not been called to our attention in relation to ureteritis, namely, the relation of the broad ligament to the ureter. That is something that has been neglected up to the present time. Undoubtedly, infection in the female gets up into the kidney through the lymphatics of the broad ligament to those of the ure-

ter. Bauereisen has said that he believes many cases of post-operative renal infection in women are due to this current. Sampson was the first one to show this relation of the lymphatics of the ureter, and especially the periureteral arterial supply, in its relation to the broad ligament in carcinoma, and that is something to elucidate by experiment. But we must take something for granted, by analogy, and that is that undoubtedly a good many of the infections will get up into the ureter, going through the bladder. You may be surprised. I had no idea until Dr. D. J. Davis advised me to make a good many sections of human ureters in cases of ascending and descending infection. You would be surprised, in cases of descending infections of the ureter, as they occur in tuberculosis, that the mucous membrane in section after section is absolutely intact, and the main changes are in the submucous and muscular periureteral coats, showing that evidently in travelling downwards the infection does not need to go along the mucous membrane, but involves the wall of the ureters.

Dr. Charles McKenna: I should infer from Dr. Kraus's paper, that packing the bladder is a common way of infecting the ureter, that is where the bladder is infected before the operation. When the bladder is packed tightly with gauze for hemorrhage, it is a common thing to get an inflammation around the trigone, hence a ureteritis. I remember one case distinctly, in which the bladder was packed for hemorrhage and two days later the patient suffered an infection in both kidneys and later died of uremia. That was before the transplantation of fat was introduced as a means of controlling hemorrhage in the bladder.

Dr. Gustav Kolischer: I would like to call attention to one point. I am firmly convinced of the importance of ureteritis and circulatory disturbance. I have made a rule never to believe in the existence of a surgical kidney unless I find changes around the ureteral opening of this side. Every time I have broken this rule I got my punishment for it. Why, for instance, the development of a tumor even in the early stages leads to pronounced circulatory disturbances at the end of the ureter, I do not know. We know that a deep-seated cancer of the mamma will lead to circulatory disturbances which are pronounced and can be seen on the surface. Why it is, I do not know, but it is so. You will find in almost all tumors of the kidney decided circulatory changes around the ureters. The same holds good in inflammation of the pelvis. I don't believe we are in possession of a sliding scale to diagnose by in conditions around the ureteral opening, as to the character of the kidney lesion. But if there is such disturbance, there is something wrong in the kidney. If lacking, the diagnosis of surgical kidney is wrong, or very doubtful. Unless the diagnosis can be made

in any other way, I don't think it is wise to interfere surgically.

That the ureteritis in tuberculosis is very important, in an operative sense, is shown by the fact that it is quite often impossible to deliver a tubercular kidney until the ureter is severed. So it shows that the ureter was shortened, which was the only obstacle to the delivery of the kidney.

SEMINAL VESICULITIS.*

By Edward Wm. White, M. D., Chicago, Ill.

In reviewing the literature on seminal vesicle studies, it is interesting to note the scarcity of material at our disposal and the limited number of men who have contributed. Seminal vesicle studies have only recently been given the center of the stage, not however due to a lack of interest, but in all probability to an incomplete knowledge of the correct pathology and also the difficulty of a rational surgical approach. An article on the seminal vesicles could not be considered in any degree complete were such men as Fuller, Squier, Belfield, Schmidt, etc., omitted. We are indebted to these early observers for our stock of knowledge on these subjects. Fuller's operative studies on the vesicles date back as early as 1901, and the work advanced at that time forms practically the basis of our present operative procedure. The Squier classification of symptomatology as "Pain, Pus, and Rheumatic groups," will cover practically all classes that have as yet come to our service. The Belfield studies and operations on the vas have certainly lighted the path for future experimentation and have aided quite materially our vesicle work.

We have encountered no little difficulty in arriving at a good brief classification of symptomatology and pathology. The symptoms being varied due to the anatomical proximity of the vesicle to the bladder, ureter and peritoneum. The classification primarily suggested by Fuller and Belfield has been quite satisfactory.

The symptomatology of seminal vesiculitis is exceedingly voluminous. Many of the symptoms simulate cystitis, prostatitis, colliculitis and posterior urethritis. The wide degree of variability of symptoms is due to the fact that vesiculitis in the true sense has no distinct entity, but is virtually associated with a prostatitis, a colliculitis or a posterior urethritis.

Symptomatology.

Nervous Types.—In a review of our cases we have found that practically 90 per cent. were highly neurotic and of long standing. I remember one case in particular whose nervous manifestations were so prominent that he was of suicidal intent, completely unfit for work, and on examination very little pathology was revealed, although the vesicles were exquisitely tender. We are of the opinion that the state of nervous irritability is largely due to the wear and tear of persistent pain. We have had a large number of these cases under observation, some have been operated, others treated in

*Read before the Chicago Urological Society, May, 1916.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, July, 1916.]

the usual conservative manner; the results are not gratifying, although we feel that many are relieved by the operative route, if only from a psychological viewpoint.

Bladder and Urinary.—If you pause to consider the anatomical proximity of the vesicles and the bladder, as has been demonstrated by Fuller, the cause of the bladder symptoms will be readily appreciated. We have seen in our routine cystoscopic examination of these cases a true "seminal vesiculitis cystitis" if you please, in which the mucosa of the bladder overlying the vesicle and the trigonum was hyperemic, edematous, or a mild degree of trigonal cystitis. A bladder so involved could easily account for such symptoms as irritability of the vesical neck, burning and throbbing sensations, frequency, suprapubic pressure, vesical tenesmus and acute retention which is so commonly noted. The majority of cases have a typical mucopurulent discharge of a resistant character, which is unrelieved by the ordinary methods of treatment.

Perineal and Testicle.—The symptoms referable to the perineum also are an exceedingly common associate of vesiculitis. Under this heading pain in a variable degree ranging from only slight discomfort to sensations of dragging, drawing, feeling of fullness and pressure. In one case where the perineal symptoms were quite pronounced, the patient had been unable to assume his natural stride or posture for months due entirely to constant perineal disturbances. Many of the urethral symptoms which occur at the close of urination are referred to the perineum. The testicular symptoms will be disposed of in brief, since many of the cases have had attacks of recurrent epididymitis, and naturally complain of sensitive epididymes and drawing pains along the cord. Noble and Picker were among the first to arrive at the conclusion that recurrent epididymitis was due to disease of the vas and ampulla. In all cases the perineal and testicular symptoms were duly prominent.

Sexual Symptoms.—If you pause to consider the true functions of the vesicles you will not be surprised to find many symptoms of a sexual nature. In the early stages of the disease, frequent erections with an excess of nightly pollutions are not uncommon, also, as the condition progresses, a gradual diminution in sexual strength and finally absolute loss of erections or impotency is noted. Painful orgasm, painful and incomplete erections, hemospermia, pyospermia, etc., are all common findings in seminal vesiculitis.

In the opinion of Schmidt, all cases of blood and pus in the ejaculate, or blood and pus following vesicle massage, are proof positive of a vesicle involvement and are worthy of surgical consideration. It is interesting to contemplate the improvement sexually in these patients following vesicle drain. Fuller has reported a number of such

cases in which the sexual status was practically normal six months after operation and our results have been similar.

Abdominal.—The abdominal symptoms are due to the peritoneal investment and may simulate acute appendicitis, ureteritis, ureteral colic or stone, and are due to the close proximity to the bladder. Abscess formations with perforations into this viscus have been reported, also rupture into the peritoneal cavity by way of the recto-vesical cul-de-sac. Pyemia has been known to follow a septic phlebitis of the adjacent venous plexuses. Pelvic cellulitis with marked suppuration is possible. Dull persistent suprapubic pain, constant pains in the lower lateral quadrants of the abdomen with a chronic urethral discharge should always suggest vesicle trouble. In reviewing our cases all have had one or more abdominal symptoms.

Rectal and Anal Symptoms.—Rectal explorations will usually establish a diagnosis pathologically classified and named in the order of comparative frequency, we have seen:

1st. The acute catarrhal type. The vesicle may be soft and almost lost in the folds of the rectum or greatly distended, tense and exquisitely tender.

2nd. Fibrous or sclerotic type. The vesicles are firm or markedly atonic, the pains being variable.

3rd. Suppurative type or abscess cavities.

4th. Pan-inflammatory type. The prostate and vesicles are matted together in one composite mass of inflammatory tissue, with hardly a vestige of normal landmarks remaining. This type is productive of pains that are referred to the hypogastrium, loins, anus, perineum and sacro-iliac synchondrosis.

The sensation of warmth, fullness and itching about the anus is often complained of and is generally prominent in any form of vesiculitis. The symptoms are due to the association of the vesicle and prostatic plexus with the sacral and lumbar nerves. Cowperitis and hemorrhoids will frequently, however, produce similar symptoms and should be ruled out.

Rheumatic.—Rheumatic or joint symptoms are very uncommon in our experience, however many cases have been reported by other authors. It is not difficult to understand from our knowledge of the anatomy of the vesicle and an understanding of inflammation in organs of a similar type, the *modus operandi* of systemic infection. The seminal vesicles, once invaded by pathogenic organisms whether they be gonococcus, streptococcus, staphylococcus or colon bacillus, soon enter upon a chronic inflammatory state due to insufficient drainage. The vesicle sacs are characterized by marked chronicity with an attenuated form of virulence, infections may be harbored for years, periodically expressing septic material into the general circulation. The synovial membranes are areas

of choice predilections due to their natural weakness for invading organisms. Squier states, "The synovial fluid is lymphocytic instead of leucocytic, hence does not offer a good phagocytic power."

Indications for Operative Intervention.—In the order of comparative frequency our cases have been attacked, first for the relief of pain, second, for the evacuation of a pus vesical, and third, the removal of hard indurated fibrous vesicles of long standing and productive of much discomfort. The rule so forcefully advocated by Schmidt as, "No undue haste need be exercised in advising operations until all palliative measures have been fully exhausted," has been religiously followed. We have had cases under observation for years, characterized by recurrent attacks of acute exacerbation, which were finally freed of all symptoms by persistent employment of palliative measures. Contrary, however, to the foregoing statement some of our cases of long standing have failed utterly of any material benefit by conservative methods, but were absolutely cured following operations. Vesiculectomy is certainly the operation of choice in long standing cases with sclerotic vesicles whereas vesiculotomy and drainage has been entirely satisfactory in pus cases and the acute catarrhal forms.

In summary it has been found that the following classifications are all surgical possibilities:

1st. Acute catarrhal with marked general and urinary symptoms.

2nd. Chronic fibrous, sclerotic, unrelieved by treatment.

3rd. Pus and blood after massage or in the ejaculate which persists.

4th. Sexual neurasthenia with a progressive diminution of sexual strength.

5th. Tuberculous vesicles.

Vasotomy has been resorted to in selected cases as a preliminary step, (like the suprapubic drain prior to a prostatectomy) and the results were only temporarily gratifying, particularly in the cases complicated by recurrent epididymitis.

1. M. E., age 39, married, Bulgarian, came under our observation at the Michael Reese Hospital, December 6th, 1915. One attack of urethritis six weeks prior to examination. No luetic history. Present complaint started two weeks after his urethral infection when he developed an acute severe epididymitis and marked pain in perineum and anus, with difficult urination. These symptoms had persisted up to the date of our examination with increasing severity.

Examination.—Temperature 102°, pulse full and bounding; patient very septic in appearance, complaining of nausea and vomiting in addition to his urethral symptoms. Also acute retention which was relieved by catheter.

Genitalia.—Profuse gonorrheal discharge, very sensitive and infiltrated epididymes, with associated orchitis, also thickened and sensitive vas.

Per Rectum.—Prostate enlarged, irregular and painful. Vesicles enormous in size, fluctuating and extremely sensitive.

Culture following vesicle massage revealed a growth of staphylococcus, and gonococcus. White count, 28,000.

Treatment.—Vesiculotomy with drainage was performed with the evacuation of a large quantity of pus. Two days following the operation all symptoms were alleviated. White count 15,000, temperature 99°, no retention, and no discomfort. Thirty days later the patient left the hospital, state of general health satisfactory and perineal incision completely closed. The epididymis was still quite sensitive on firm palpation. Sexually normal and a rapid gain in health and strength.

2. C. M., age 45; married; American; has been under our observation a number of years with three or four attacks of urethritis dating back to 1908. His urethral attacks were all characterized by more or less vesicle irritability, persistent discharge, aching pain in glans penis. His condition was unimproved by the usual treatment although religiously followed in every detail. In June of 1910, a bilateral vasotomy was performed with only temporary relief of symptoms. On examination January, 1916, the patient had gained fifty pounds in less than eight months due to inactivity occasioned by his continual genital disturbances. He was extremely neurotic, phlegmatic and entirely unfit for any mental or physical work.

Rectal Examination.—Hard, indurated and exquisitely tender vesicles. Epididymis, no pathologic change but very painful on palpation. The discharge following vesicle massage was heavily laden with pus and blood. A vesiculectomy was done in February, 1916, and although the operative course was unusually protracted, the patient left the hospital four weeks later greatly encouraged over his improvement. When seen April 4th, practically all symptoms had disappeared. Sexually improved and attending to his daily duties. The pain at the meatus remained tenaciously but was finally relieved by caput applications. His case was one of much interest due to the prolonged, drawn-out treatment, and clearly demonstrated the fact that vesiculectomy is the operation of choice in long-standing and selected cases.

3. M. T., age 28; married; laborer. Presented for examination January, 1916. His past history gave one attack of urethritis six years before, this being complicated by epididymitis and prostatitis. He complained of swelling and pain in left testicle of six weeks' standing, also severe, sharp, stabbing pain during ejaculation with a bloody ejaculate. The pain during intercourse would continue from one to two hours with marked depression following. He had not been exposed to any recent infection but complained of constant mucopurulent discharge, and constant aching pains in the perineum and lumbar regions.

Examination.—Urine very cloudy with specks and shreds. Urethral smear was negative to gonococci but contained an abundance of other bacteria and many pus cells. Prostate enlarged and regular in contour, very sensitive. The vesicles were large and atonic; acutely painful. The culture following vesicle massage gave colonies of staphylococcus and the smear full of pus and blood. The left epididymis was involved in inflammatory infiltration.

Treatment.—Seminal vesiculectomy was performed in the usual manner as described by Schmidt in a recent paper and an uneventful post-operative course followed. The patient was up and about in twelve days after the operation, and although still complaining of many of his former symptoms was dismissed in three weeks. When seen four weeks later he gave a favorable report, all pains had completely disappeared, sexually perfectly normal, with a marked improvement in general health. It has been found that these cases do not clear up immediately after the operation but nature must be given time to adjust itself.

4. C. C., age 38; married; chauffeur; examined November 8th, 1916. He gave a past history of one attack of urethritis eighteen years ago complicated by left epididymitis and stricture formation. Patient stated that he had never been entirely free from symptoms since first infection. He complained of a constant burning in the urethra with discharge, burning, throbbing and drawing sensations

in perineum, and frequency in urination. Sexually vigorous by complaining of an aggravation of all symptoms following any sexual act.

Examination.—A bilateral inflammatory infiltration of cord and epididymis. Rectal examination revealed hard and cord-like vesicles which were extremely painful on palpation. The smear following vesicle massage contained almost pure pus and blood, culture gave colonies of bacillus coli. Urethroscopically, decided congestion of posterior urethra, a hypertrophied and easily bleeding caput, very sensitive.

Cystoscopically.—Congestion of vessels of base, slight degree of trigonal cystitis and unquestionably congestion of vessels of the mucosa overlying the vesicles.

Treatment.—Seminal vesiculotomy with drainage November 13, 1916.

Post-Operative.—In ten days following the operation was noted a marked diminution in the intensity of all symptoms. The drains were removed on the fifth day and the patient was fairly comfortable. He complained, however, of loss of erection. The post-operative course was uneventful and he was dismissed two weeks later with perineal incision practically closed. When seen two months afterward he complained of absolute loss of erections and desire, also areas of anesthesia extending over the left half of the scrotum and localized parts in perineum. His general state of health was splendid, no pain nor discomfort and all former symptoms had entirely disappeared. His sexual condition was only slightly improved when seen three months following the operation, however, the areas of anesthesia had disappeared. We are of the opinion that his sexual status will return to normal in time, since regular caput applications have given some slight improvement.

5. J. W., age 30; single; American. He gave a past history of prostatitis in 1903, and an external urethrotomy in 1914, also several attacks of urethritis. He came under our observation complaining of extreme nervousness, constant suprapubic pain, frequency of urination with dribbling, sexual weakness and a complex of irritative symptoms referable to the perineum and external genitalia. He had been under our care since 1907 with varying degrees of improvement and decline, highly neurotic and unusually sensitive. The usual method of treatment was conformed to with unsatisfactory results. In February, 1913, a bilateral vasotomy was performed with only a temporary alleviation of symptoms. Four weeks later his condition was exceedingly unfavorable, embracing an inhibition of sexual desire, with loss of erections and also muscular spasms in the perineum. His attempts at intercourse were followed by lancinating pain and bloody ejaculate. He became totally unfit for mental or physical effort, a complete nervous breakdown.

Examination.—Cystoscopically congestion and contraction of the urinary surface, mild degree of trabeculation with severe trigonal cystitis. Genitalia, negative as to morbidity but unusually sensitive to palpation, especially the epididymis and vas.

Treatment.—Seminal vesiculotomy with drainage February, 1915, and although the post-operative course was prolonged the results were satisfactory. In four months following his dismissal from the hospital the irritative symptoms of the perineum, rectum and epididymes were practically gone, the nervous irritability was relieved and his state of health improved. When seen about two months ago he had gained thirty pounds. Dr. Schmidt, who examined him cystoscopically at the time, reported a marked improvement in vesicle findings and a satisfactory condition per rectum. Persistent rectal douches and Sitz baths had relieved the inflammatory rectal findings. This case, in all probability, was the most difficult that we have had under our observation and considering the magnitude of symptoms and pathology we feel satisfied with the results.

L. B., age 28, single, laborer. Patient developed an at-

tack of acute retention during the course of an acute urethritis. He complained of deep perineal pain and tenderness, pain on defecation, aching pain in inguinal regions and profuse gonorrheal discharge. He was very septic in appearance, temperature 103°, pulse 120 and white count 22,000.

On examination per rectum, there was revealed a large tumefaction, bulging into the rectal space. Immediate seminal vesicle drainage advised. The vesicles were exposed in the usual manner and could be easily outlined. A large quantity of pus was evacuted from each vesicle and the parts drained. All symptoms were greatly relieved and normal urination was established within twenty-four hours following operation.

A. L., age 34; Italian. Seen at Alexian Brothers Hospital. The patient gave a past history of five attacks of urethritis of which two were complicated by epididymitis. He presented himself complaining of urinary frequency with great pain during and after intercourse, also sharp stabbing pain during ejaculation.

Examination.—The typical chronic mucopurulent discharge at meatus a case of infiltrative urethritis; his urine was turbid in all glasses and contained a quantity of spermatozoa. The third glass following vesicle massage was laden with pus and blood.

Rectal palpation revealed a pair of dense, sclerotic sensitive vesicles, irregular in outline. Seminal vesiculotomy was performed. The post-operative course was uneventful, and when seen eight weeks later after his dismissal, patient reported intercourse entirely satisfactory, and no urinary symptoms.

The question naturally arises after hearing the report of cases as to when is vesiculectomy indicated and when should a vesiculotomy be advised. In our opinion the vesicles should be removed intact in all cases of multiple abscesses with extensive destruction of the tissues. Secondly, the cases of long standing with hard fibrous sclerotic vesicles that are productive of bladder changes. Thirdly, that class of cases in which the vesicles and ampulla, due to proximity to the ureter and surrounding parts, are productive of symptoms referable to these organs. While in our opinion, (and in that of others), it is not advisable to remove the vesicles unless they are sufficiently pathologic, yet in selected cases of extreme nervous origin unaltered by the usual methods of treatment, seminal vesiculectomy has been entirely satisfactory.

Relative to seminal vesiculotomy, we have considered all cases of spermatorrhea, all cases of pus and blood in the ejaculate and following vesicle massage, and the acute catarrhal and suppurative type. As yet no tuberculous, cystic or calcareous cases have been operated on by us. In view of the fact that work on the vesicles is still in a primitive stage and the tabulated results of other observers so scarce, we have had no little difficulty in arriving at good operative classifications. The majority of these cases reported have been operated within the last year and further observations will certainly reveal important information.

As a closing remark I should like to thank Dr. L. E. Schmidt for his kind co-operation and assistance in making this report possible.

BIBLIOGRAPHY.

1. Squier, Indications for Operations on the Seminal Vesicles. *Boston Medical and Surgical Journal*, 1914, CL. XX, 908.

2. Squier, Surgery of the Seminal Vesicles. *Cleveland Medical Journal*, 1913, XII, 801.

3. Smith, E. O., Anatomy and Pathology of the Seminal Vesicles. UROLOGIC AND CUTANEOUS REVIEW, V. 22, February, 1916.

4. Hyman and Saunders, A Clinical Resumé of Chronic Seminal Vesiculitis. *New York Medical Journal*, 1913, V, 97, pp. 652-654.

5. James and Shuman, Seminal Vesicle Calculi Simulating Nephrolithiasis. *Surgery, Gynecology and Obstetrics*, XVI, 1913.

6. Thomas and Pancoast, Observations on the Pathology, Diagnosis and Treatment of Seminal Vesiculitis. *Annals of Surgery*, 1914, V. 60, p. 313.

7. Fuller, Seminal Vesiculitis. *Journal American Medical Association*, Nov. 30, 1912, p. 1901; *Journal American Medical Association*, May 4, 1901, p. 1901; *Journal American Medical Association*, Nov. 30, 1912, p. 1951; *New York Medical Record*, Oct. 30, 1909; *Annals of Surgery*, April, 1905; *New York Medical Record*, May 21, 1904; *New York Post-Graduate*, Oct., 1904; *American Journal of Urology*, December, 1906.

8. Belfield, Irrigation and Drainage of Seminal Duct and Vesicle Through the Vas Deferens. *Surgery, Gynecology and Obstetrics*, 1906.

9. Cabot, Some Suggestions in Regard to the Diagnosis of Seminal Vesiculitis. *Boston Medical and Surgical Journal*, May, 1915.

10. Billings, *Archives of Internal Medicine*, April, 1912; *Journal American Medical Association*, Sept. 13, 1913.

11. Schmidt, Vesiculectomy and Vesiculotomy. *Journal American Medical Association*, Jan. 15, 1916.

12. Plaggemeyer, Tuberculosis of the Seminal Duct. *Journal Mechigan State Medical Society*, 1916, XV, 118.

1616 Mallers Bldg.

ASPERMATISM.*

By V. D. Lespinasse, M. D., Chicago, Ill.

Aspermatism as defined by Roubaud in 1855 is characterized by the failure of ejaculation with a normal erection as against priapism and with neither perversion or exaltation of the normal faculties as against erothromania.

Roubaud reported one case of his own and describes one case as occurring in the practice of Cockburn of Venice.

My patient came to me complaining that the act of intercourse was never satisfactorily finished. He is married and has never attempted intercourse with any one but his wife and has had this trouble throughout his entire married life. He has never been sick, is in perfect general health, an automobile salesman by occupation, has never had any venereal disease. Examination shows a young man 25 years old of normal nutrition and of a healthy color. The external genitals are normal as to size, development and general appearance. Testicles are of normal size, normal tension and both hang in the scrotum as they should. Penis is of normal size, urine is clear and free from albumen and sugar. Rectal examination shows the prostate, vesicles and bulb of the urethra normal. Cystoscopic and urethroscopic examinations reveal nothing pathological. He has normal sexual desire, normal erections, normal penetration and normal intercourse in every way up to the point of ejaculation. No matter how long or how vigorously the act is carried out or what psychic aids are brought into play, ejaculation never takes place and the act is concluded when both he and his wife are physically exhausted or simply stop. The patient has dreams which are accompanied by emissions and the fluid discharged contains prostatic fluid, spermatozoa and all the elements that a normal man would pass under similar circumstances.

From cursory examination of literature I find two similar cases reported from American literature, one by H. C. Simes of New York, in the *N. Y. Medical Journal* in 1895, and one by W. H. Van Buren, Vol. 8, page 126, of the *New York Medical Journal.*

*Read before the Chicago Urological Society, May, 1916.

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, July, 1916.]

TRANSACTIONS

Chicago Urological Society.

The Annual Meeting of the Chicago Urological Society was held Thursday evening, May 25th, at Hotel Sherman, the President, Dr. H. L. Kretschmer, in the chair.

The first item on the program was a paper by Dr. E. W. White, entitled "Indications, Results and Case Reports of Seminal Vesiculotomy and Seminal Vesiculectomy." (July issue this journal.)

Dr. Kretschmer requested that, owing to the large volume of business, the discussion be limited to four minutes each.

Dr. L. W. Bremerman: I would like to ask Dr. White a question. Although he expressed very clearly the differentiation between those cases where vesiculectomy and vesiculotomy are possible, it did not appear clear to me in which cases vesiculectomy was indicated and in which vesiculotomy was indicated. In one group he said that vesiculectomy was indicated, and if he would make that point a little more definite I think it would throw more light on the subject for all of us.

Dr. Robert H. Herbst: I was quite pleased to hear the emphasis which Dr. White placed on the importance of surgical intervention in the treatment of seminal vesicle infections. I do not quite agree with him as to the choice of operative procedure. I believe that vesiculectomy is almost never indicated in seminal vesicle infections. I can remember the day when surgery directed to infection of the seminal vesicles was extremely rare, but today I think most of us believe that we should interfere surgically in many of these cases. When the gonococcus invades the male urethra, I believe that about 90 per cent. of cases become posterior, and that in almost every case the seminal vesicles become involved. When this occurs, I am convinced that the chance for cure by palliative measures or spontaneous healing is remote. In many of these infections, especially of the gonococcus type, vasotomy followed by injections of the vesicles with collargol solution, has proved very efficacious in my hands. There are cases in which vesiculotomy is indicated, but I believe they are in the minority.

Dr. V. D. Lespinasse: I don't think any of us would hesitate to open up the type of vesicle Dr. White has described, for they were acute cases with acute inflammatory symptoms. We all see another type of case, however, and that is the type of case that gives me the greatest concern as to operative treatment, for instance, the man who has a slightly thickened vesicle and who has a discharge, possibly a little pus in his ejaculate, but you are not sure whether it comes from the vesicle or the

[Reprinted from THE UROLOGIC AND CUTANEOUS REVIEW, July, 1916.]

prostate. He may have a prostatitis as well as a vesiculitis. That is the type of case that makes it hard for me to decide whether to operate or not, and which operation to perform. I have done a vasotomy on this type of case; sometimes successfully, but my results have not been particularly brilliant. Very few of my cases with chronic vesiculitis will submit to the three or four weeks' hospital stay for necessary vesiculectomy. They will accept the one day which vasotomy entails. In these cases I make an X-ray after the vesicle is injected and also determine if the fluid comes through into the urethra quickly or slowly. If it comes through very rapidly I interpret it to mean that the vesicle is small. Then, backed up by the picture, if it shows a few convolutions I interpret it to mean that later on this vesicle may be a case for vesiculectomy, as the vesicular walls are infiltrated. When you have cured your vesiculitis have you really cured your patient? I think we may cure the vesiculitis and have the infection still present in other locations. That is a stumbling block to me, and a great disappointment to the patient. They are operated for the relief of the discharge and you have done a brilliant operation—but the patient still has the discharge coming perhaps from a urethral folicle or the prostate.

DR. WELFELD: While vesiculectomy is still in its infancy, I think operative procedure should be indicated only in the cases Dr. White has mentioned. I think all cases of vesiculitis should be subjected to palliative treatment as much as possible. Most patients of the better element will not submit to operative treatment unless they absolutely have to. They know from previous experiences that the attacks will subside in a short time with possible recurrences in the remote future. But the inconvenience of the attacks does not compare with the inconvenience of such an operation with weeks and weeks of convalescence.

DR. CHARLES MCKENNA: I don't think that Dr. White mentioned the question of sterility in connection with doing vasotomy. By this I don't mean that all patients become sterile after vasotomy, but I do mean that some patients are made sterile after a number of injections are made into the vas. I think it is quite necessary that the patient should be made to understand the possibility of sterility after doing such an operation. I know of two cases that have been made sterile by doing vasotomy. It stands to reason that when the operator is dealing with a lumen as small as that in the vas, he is bound to get organization from traumatism and blood clot. I therefore think it is highly necessary that this point be taken into consideration.

DR. J. S. EISENSTAEDT: I think there is another type of seminal vesiculitis which does not come in the classification by Fuller and Belfield, and that is a type of subacute or catarrhal vesiculitis. I had a case this week which emphasized that

type. I had a patient who complained of intense pain in the right testicle shooting up into the groin to the iliac crest. There was no temperature. The pains would force him to double up like the pains of appendicitis. The patient is married and has not been exposed to infection for six years. He had gonorrhea eight years ago. The prostate showed nothing abnormal to palpation, but the right vesicle was tender—not exquisitely so, however. I was surprised at the amount of pressure which he stood without complaining. After stripping the vesicle two or three times and putting argyrol in, the pains of which the patient complained entirely disappeared.

Another point which I believe should be emphasized is the very definite information which we are able to get by cystoscopic examination. As Dr. White so accurately described, the trigonitis is usually unilateral, and if not unilateral at least very much more marked over the side where the vesicle is affected. There are many cases of vesiculitis without any epididymitis.

DR. H. L. KRETSCHMER: Surgical treatment of the seminal vesicles has the call of the day. The surgical management of these cases will have to be considered from two standpoints: first, indications for operation, and second, the end results. Cases in which there is acute pus infection of the seminal vesicules I think should be opened and drained. I recall two or three such patients who had complete retention: the vesicles were opened and drained which was followed by complete relief of the symptoms. I think the chronic cases should be selected with a great deal of care and, only after non-operative treatment has failed. I have talked with a number of men who had performed vesiculotomy and vesiculectomy as to end results, particularly as to the sexual results, and they all tell you that one or two of their cases have had a complete loss of sexual power. I think this is very important and I am going to ask Dr. White to tell us his results. I don't believe these cases should be operated upon just to be operating. I should like Dr. White to tell us in how many cases they were able to demonstrate gonococci in the vesicle, and in their absence to tell us what organisms they found.

DR. HERBST: I feel that I cannot allow Dr. McKenna's statement to go unchallenged. Do you believe that every case upon which you perform a vasotomy is made sterile?

DR. MCKENNA: I didn't say that all patients were made sterile from this operation but that there was a percentage who were made sterile by this operation. I also said the thing to do was to explain to the patient the possibility of making him sterile and that he should be told that before the operation. I can report two cases in which this happened and I did not do the original operation in both of them.

DR. HERBST: Out of how many cases? We know that many cases of seminal vesicle infections are sterilized by the disease. Also, that any of the operations, such as vesiculectomy or vesiculotomy, may be followed by sterility, but I am satisfied that if this does occur following vasotomy, it is extremely rare.

DR. KRETSCHMER: It seems to me that this question of sterility following vasotomy, vesiculotomy, and vesiculectomy operations will make a good subject for a meeting sometime next winter. Many of us know a case or a couple of cases that we could report and we might devote an evening to the subject.

DR. E. W. WHITE: In my opinion Dr. Bremerman has asked the most difficult question of the evening, viz.: "In what class of cases is seminal vesiculectomy indicated and when would vesiculotomy be advised?" It is almost impossible for me to advance any set rule on this important question. We are all aware of the fact that a pus vesicle should be opened and drained, also those cases of acutely distended vesicle which are productive of urinary retention; whereas the cases that are studded with abscesses, also the chronic cases of long standing which are not benefited by the usual palliative measures we advise a seminal vesiculectomy. I have in mind one case in which we did a vesiculotomy and prostatotomy and at a later date a vesiculectomy with gratifying result.

Relative to the duration of the time necessary to remain in the hospital, would say that it generally takes two to three weeks, and the patients generally object to this. However we are in the habit of advising operative interference in every case that is necessary regardless of time limit, etc.

It is true that the discharge does remain after these patients have been operated and sometimes remains constant over a long period. I think Fuller makes the statement that you should not treat the discharge that persists after vesiculectomy. We have treated these cases locally but the discharge has persisted in many of them.

"How many cases have we cured?" I cannot give you the exact figures but I think fully 90 per cent. have been cured, all symptoms being relieved. The urine clears up, they are sexually normal and general health satisfactory. I cannot tell you the exact number of cures.

Dr. Eisenstaedt spoke of the subacute or catarrhal type of cases and I have mentioned this type in my classification. We have noted that many of these cases complain of persistent pain at the urinary meatus following vesiculectomy and have used caput applications as a therapeutic measure, with good results.

* * * * * * *

The second item on the program was a discussion of aspermia, with report of a case, by Dr. V. D. Lespinasse. (July issue this journal.)

In opening the discussion, Dr. Bremerman said: This question of aspermia I think is an exceedingly interesting one and one which most of us have had some experience in handling. I don't think that I have ever seen the exact type that Dr. Lespinasse has described, but I have seen many cases in married men who have come in for examination for the purpose of knowing why they could not have families, and in the examination of a condum specimen I have found no sperm at all. I would like to ask Dr. Lespinasse what he has done for this type of case.

DR. D. LIEBERTHAL: Inasmuch as in the condition described sperma was generated, but not ejaculated, we should rather use for it the term blocking of ejaculation instead of aspermia. The whole subject of disturbances in the male sexual functions is very interesting, and I may be permitted to touch also on the question of azoospermia. In some individuals who are otherwise well, there is a continuous absence of spermatozoa. The condition is congenital. There is another large class where it is temporary or may become permanent. So we find it after great loss of semen from sexual excess, after often repeated nightly emissions. Azoospermia may also occur in tuberculosis, alcoholism and various chronic diseases, and in nervous affections. We are frequently called upon to examine sperma for spermatozoa. Even in using all precautions, one is not justified to draw conclusions from just one examination. Only after such have been made repeatedly and at long intervals, can an opinion be expressed. This is especially true when testimony is to be given in court. I recall one case which is quite instructive. The patient was healthy in every respect and was fulfilling his marital duties well, but no impregnation took place. His wife was anxious to have children. She was examined and found to be in excellent condition by a gynecologist. I examined his semen a few times within a month. No spermatozoa were found. After a long interval such were discovered in the semen, but they were dead. The examinations were continued and gradually live spermatozoa were found in increasing number.

The case reported by Dr. Lespinasse is exceedingly interesting and I enjoyed listening to it very much.

DR. V. D. LESPINASSE: I would like to get clear in your minds the difference between aspermia and azoőspermia. In aspermia if you examine the condum there will be nothing in it. I brought this condum to show a marked diminution in the amount of semen from a man who probably has a lesion in both of his ejaculatory ducts and all you obtain in his condum is prostate and urethral gland secretion. There is probably no more than half a c.c. Ordinarily there is about four c.c., with a maximum normal of about nine or ten c.c. In looking up the literature a little bit I found that these cases

were confused with cases of malemission. One interesting malemission case was where the semen was discharged up in the epigastric region through three openings. I saw a guinea pig a year ago with tuberculosis and the bladder was filled with spermatozoa from a fistula up between the bladder and the seminal vesicle. That was a case of malemission. The treatment in these cases of idiopathic aspermia has been along antispasmodic lines. This particular case that I have told you about has just come under observation and has not yet been treated.

The observation of Dr. Lieberthal interested me very greatly. I have had the experience of examining semen for sperm and usually I find it present when someone else has said it was absent. We know that we can have, depending upon the general health of the individual, a marked difference in the number and particularly the motility and viability of the spermatozoa.

CONTRIBUTORS TO THIS VOLUME.

	PAGE
Abt, Isaac A.	134
Bacon, Charles S.	176
Belfield, William T.	123
Blount, A. L.	150
Bremerman, Lewis W.	138
Brennemann, Joseph	171
Cary, French S.	102
Charlton, Frederick	31
Corbus, B. C.	95
Curtis, Arthur H.	162
Ehrich, William S.	35
Eisendrath, Daniel N.	188
Eisenstaedt, J. S.	18
Elam, W. T.	92
Gardner, James A.	91
Gradwohl, R. B. H.	115
Grulee, Clifford G.	158
Harpster, Charles M.	90
Heaney, N. Sproat	170
Herbst, Robert H.	130
Herrick, F. C.	91
Jost, William E.	115
Kolischer, Gustav	26
Koll, Irvin S.	141
Kraus, Harry A.	195
Kretschmer, Herman L.	1
Lespinasse, Victor D.	128
Lieberthal, D.	218
Lower, W. E.	101
McCollom, Wm. E.	91
McKenna, Charles M.	192
Marchildon, J. W.	121
Mark, Ernest G.	37
Martin, W. F.	97
Mowry, Albert E.	144
Plaggemeyer, H. W.	79
Ravogli, A.	62

PAGE
Ricketts, B. M. 99
Ries, Emil 178
Robbins, Frederick W. 56
Scherck, Henry J. 28
Schmidt, Louis E. 123
Smith, E. O. 40
Smith, Theo. H. 92
Staley, R. W. 73
Stokes, A. C. 49
Thomas, Gilbert J. 66
Warden, Carl C. 125
Webster, Clarence J. 181
Webster, Ralph W. 143
Welfeld, Joseph. 215
White, Edward W. 205
Wright, Franklin B. 90

BIOLOGY
LIBRARY
713224
RC870
C5
1915-16
UNIVERSITY OF CALIFORNIA LIBRARY